VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor industrial permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from cooling water from a hydroelectric power generation operation. This permit action consists of revising the special conditions. (SIC Code: 4911)

1. **Facility Name and Address:**
   Philpott Dam Hydroelectric Plant
   810 Dam Spillway Road
   Bassett, Virginia 24055
   Location: 810 Dam Spillway Road

2. **Permit No: VA0090310** Existing Permit Expiration Date: November 30, 2014

3. **Owner / Facility Contacts:**
   Mary C. Lawson, Conservation Biologist, (276) 629-4512;
   Mary.C.Lawson@saw02.usace.army.mil

4. **Application Complete Date:** June 11, 2014
   Permit Drafted By: Becky L. France, Water Permit Writer
   Date: June 12, 2014
   DEQ Regional Office: Blue Ridge Regional Office
   Reviewed By: Kevin Crider, Water Permit Writer
   Date: August 21, 2014
   Public Comment Period Dates: 7/24/14 to 8/22/14

5. **Receiving Stream Classification:**
   Receiving Stream: Smith River (River Mile: 46.81)
   Watershed ID: VAW-L52R (Smith River/Town Creek/Blackberry Creek Watershed)
   River Basin: Roanoke River
   River Subbasin: Roanoke River
   Section: 3j
   Class: VI
   Special Standards: PWS

7-Day, 10-Year Low Flow:	41 MGD	7-Day, 10-Year High Flow:	51 MGD
1-Day, 10-Year Low Flow:	20 MGD	1-Day, 10-Year High Flow:	22 MGD
30-Day, 5-Year Low Flow:	56 MGD	Harmonic Mean Flow:	74 MGD
Tidal:	No	303(d) Listed:	Yes (Mercury – Fish)

   Attachment A contains a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** None

7. **Reliability Class:** NA

8. **Permit Characterization**:

( ) Private ( ) Interim Limits in Other Document
(X) Federal ( ) Possible Interstate Effect
( ) State
( ) POTW
( ) PVOTW

9. **Wastewater Treatment System:** A description of any wastewater treatment system is provided below. See **Attachment B** for the water flow schematic and **Attachment C** for a copy of the site inspection report. Any treatment units associated with the discharge are listed in the table below.

Table I
DISCHARGE DESCRIPTION

Outfall No.	Source of Discharge	Treatment (Unit by Unit)	Flow (Max 30 Day Average) MGD
001	Philpott Dam Hydroelectric Plant shaft packing cooling water, dam seepage	oil-water separator (shaft packing cooling water & shaft packing cooling water, shaft leakage, dam seepage) filter (shaft packing cooling water, shaft leakage, dam seepage, ground water)	0.15 MGD
002	Philpott Dam Hydroelectric Plant air conditioning, air housing, and generator bearing noncontact cooling water	None	0.767 MGD

Outfall 001 consists of shaft packing cooling water, shaft leakage and dam seepage (lake water). This water is collected in a station sump and pumped to the tailrace. The pump operates with a float mechanism that runs when the water reaches a predetermined level in the sump. Shaft packing cooling water and shaft leakage are treated by an oil-water separator prior to discharge into the station sump. Lake water seepage from around the dam is skimmed and then discharged into the station sump. Water leaving the station sump is discharged to the tailrace.

Outfall 002 consists of noncontact cooling water from the air conditioning, generator bearings, and air housing. The air conditioning cooling water is discharged to the stilling basin through a pipe on the side of the power house. Lake water is passed through a copper coil and used to cool air being passed over it. This system functions as the air conditioning system for the main office, control room, kitchen, and locker room.

Each turbine generator has bearings which allow for unencumbered rotation of the shaft, and these bearings are water-cooled. The purpose of the bearing cooler is to lower elevated lubricating oil temperatures caused by friction between the bearing and the rotor. The transfer of heat is accomplished by passing the heated oil over a series of cooling coils containing service water taken from Philpott Lake. Noncontact cooling water that cools the turbine bearings is discharged through three draft tubes to the stilling basin. The stilling basin is located near the base of the dam, to calm flood water released through the sluice gates and over the spillway before it enters the river bed.

Water from the lake is passed through heat exchangers located within the generator housing within the wheel pit. The noncontact cooling water is discharged directly to the stilling basin and enters the water below the surface.

10. **Sewage Sludge Use or Disposal:** Not Applicable (All domestic wastewater is discharged to the sanitary sewer.)

11. **Discharge Location Description:**
The latitude and longitude of outfall 001 is N 36°46'52", E 80°01'38" and outfall 002 is N 36°46'53", E 80°01'37".

Name of Topo: Philpott Lake,Virginia Number: 050D

12. **Material Storage:**.

All chemical used at the hydroelectric plant are stored inside. Batteries with muriatic acid are stored in a room. Another room contains lubricating oil, grease, 5-gallon oil cans, small quantities of paint thinner, WD-40, cleaner, and absorbent materials. Also, there are 55-gallon drums of lubricating oil in secondary containment. Any spills in this room are collected by a floor drain and a trough located along two sides of the room and routed to the station sump.

13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

The facility discharges into the Smith River below Philpott Dam. **Attachment A** contains a copy of the flow frequency determination memorandum.

The facility discharges into the Smith River/Town Creek/Blackberry Creek Watershed (VAW-L52R). As described in the 2012 Impaired Waters Summary, Philpott Reservoir has been designated as impaired due to high mercury levels in fish tissue (**Attachment E**).

The Virginia Department of Game and Inland Fisheries (VDGIF) and US Fish and Wildlife Service has designated the reach of the Smith River downstream from the discharge points as threatened and endangered species water for the Roanoke logperch. The Roanoke logperch is listed as a federal endangered species and its presence is known to occur in the Smith River. The federal species of concern, state threatened (FSST) orangefin madtom is also known to occur

within the Smith River. A copy of the Division of Natural Heritage report information, US Fish and Wildlife Service comments, and VDGIF information on species of concern in the area of the discharge is included in **Attachment F**.

14. **Antidegradation Review and Comments:** Tier 1 ____ Tier 2 **X** Tier 3 ____

The State Water Control Board's Water Quality Standards includes an antidegradation policy 9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. The Smith River is listed as a public water supply in the segment where the discharge is located. The Smith River in this segment (VAW-L52R) and has been listed on Part I of the 303(d) list for high mercury levels in fish tissue but this designation was not based upon water quality data. Available pollutant data have been analyzed, and the existing water quality condition for pollutants for which data exist compared to the water quality standards. This analysis indicates the water quality of the receiving stream does not exceed numeric criteria for any pollutant analyzed. Therefore, this segment of the Smith River is classified as a Tier II water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baselines for aquatic life and human health are calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality

Where:
"WQS" = Numeric criterion listed in 9 VAC 25-260-00 et seq. for the parameter analyzed
"Existing quality" = concentration of the parameter being analyzed in the receiving stream

When applied, these "antidegradation baselines" become the new water quality criteria in Tier II waters, and effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant. Effluent data (**Attachment G**), where available, were used to determine 90th percentile pH and temperature values for the antidegradation wasteload allocation spreadsheets. Average hardness and 90th percentile pH and temperature values for the receiving stream were based upon upstream STORET monitoring data. The

average instream hardness was also used for the average effluent hardness value. Antidegradation baselines have been calculated as described above and included in **Attachments H** and **I**.

Philpott Dam Hydroelectric Plant began generating power in 1953. This facility began discharging prior to November 28, 1975 when the antidegradation policy requirements set forth in the Clean Water Act became effective. The facility's discharge is existing, and the permittee indicates no increase in operation resulting in an increase in flow. As the facility is not proposing any increase in the loading of any pollutants, the permit limits are in compliance with antidegradation requirements set forth in 9 VAC 25-260-30. The antidegradation review was conducted as described in Guidance Memo 00-2011, and complies with the antidegradation policy contained in Virginia's Water Quality Standards.

15. **Site Inspection:** Date: 04/29/14 Performed by: Becky L. France
Attachment C contains a copy of the site inspection memorandum. The last technical and laboratory compliance inspection was conducted by Gerald Duff on August 22, 2012.

16. **Effluent Screening and Limitation Development:** DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). See **Table II** on pages 13-14 for a summary of limits and monitoring requirements.

A. **Mixing Zone**

The MIXER program was run to determine the percentage of the receiving stream flow that could be used in the wasteload allocation calculations. The program output for outfall 001 indicated that 100 percent of the 7Q10, 12.23 percent of the low flow 1Q10, and 11.92 percent of the high flow 1Q10 may be used to calculate acute and chronic wasteload allocations (WLAs). For outfall 002, 100 percent of the 7Q10, 12.59 percent of the low flow 1Q10, and 12.22 percent of the high flow 1Q10 may be used to calculate acute and chronic wasteload allocations. Copies of the printouts from the MIXER runs are included in **Attachments H** and **I**.

B. **Technology and Water Quality Based Limitations (Outfalls 001 and 002)**

Flow -- Flow for outfall 001 is a calculated value based upon the production and discharge schedule. Outfall 001 flow shall continue to be estimated once per quarter and outfall 002 flow shall continue to be estimated once per year.

pH -- Limitations for pH of 6.0 S.U. minimum and 9.0 S.U. maximum are included for outfall 001 due to the inclusion of a floor drain and a collection trough from the chemical storage room. During the permit term there were no violations of the pH limits. In accordance with the Water Quality Standards in 9 VAC 25-260-50 for Class VI receiving waters, these limitations have been continued from the previous permit. The monitoring frequency has been changed to quarterly for consistency with outfalls associated with sump at other hydroelectric facilities. There are no pH effluent limitations for outfall 002

which consists of noncontact cooling water since there does not appear to be a reasonable potential for leakage of substances which might affect pH.

Oil and Grease -- A table of effluent oil and grease data for outfall 001 is included in **Attachment G**. During the current permit term there were no exceedances of the oil and grease limit. Proper best management practices are necessary to achieve low oil and grease concentrations. A best engineering judgment maximum limit of 15 mg/L for outfall 001 has been carried forward from the previous permit. The VPDES Permit Manual generally recommends monthly monitoring for industrial parameters where the flow is continuous. In the case of hydroelectric plants, the discharge from station sumps is not continuous and occurs at intervals when the facility is generating power. So, the monitoring frequency has continued as quarterly for consistency with sump outfalls at APCO hydroelectric facilities. Since outfall 002 is comprised of noncontact cooling water, oil and grease monitoring has not been included.

Temperature -- This segment of the Smith River has a Class VI designation (trout water) and a water quality standard of 20 °C to protect aquatic life. The Roanoke logperch, which is an endangered species, is known to occur in this segment of the Smith River.

STORET records were reviewed for the period from February 2004 to March 2014 for Station 4ASRE043.54 located approximately 1,300 feet below Philpott Dam. The maximum temperature for that time period was 16.8 °C which is below the water quality standard for the receiving stream.

All temperature readings for outfall 002 were below 20 °C. The highest reading of 19.2 °C occurred in August of 2007. This discharge consists of noncontact water. So, the maximum temperature limitation of 20 °C has been continued in this permit in accordance with the VPDES Permit Manual. Temperature monitoring for outfall 002 is required 1/month during the summer months of June through September. Given the historical temperature data, monitoring during the cooler months is not deemed necessary to track compliance. Due to the presence of Roanoke logperch in this segment of the Smith River and the classification of the stream as a trout water, monthly temperature monitoring during the warm months is appropriate.

Discharge to outfall 001 occurs during power generation. The cooling water in the station sump water is discharged to the tailrace of the dam where it mixes with a large quantity of cooler water released during power generation. The discharge from the station sump (0.045 MGD long term average) would not be expected to exceed the water quality standard once it mixes with the water from the tailrace. Therefore, a temperature limit will not be required for outfall 001.

C. Toxic Pollutants

In addition to the standard limitations, the discharge must be evaluated to determine whether there is a reasonable potential for the effluent to violate the water quality standards (WQSs) adopted by the State Water Control Board (9 VAC 25-260 et. seq).

Toxic pollutant data were listed as believed absent in the permit application except for dissolved copper and dissolved lead. These metals were not detected in the sample collected for the application.

The facility's SIC Code (4911) is not listed in the VPDES Permit Manual for inclusion in the Toxics Management Program. Therefore, toxicity testing has not been required.

Stormwater
There are no monitoring requirements associated with discharge from the generator area. The SIC Code associated with the facility is not regulated as storm water associated with industrial activity as per 9 VAC 25-151-10 of the VPDES permit regulations. The transformer was replaced in 2010 and a liner was added to the containment area. The receiving stream has not been designated as impaired for PCBs. Therefore, no PCB storm water testing has been required in the permit.

17. **Antibacksliding Statement:** Since there are no changes in the limitations from the previous permit, the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulation.

18. **Compliance Schedules:** For this reissuance, there are no compliance schedules.

19. **Special Conditions:**

A. **Notification Levels (Part I.B.1)**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 A for all industrial permits for manufacturing, mining, commercial, and silvicultural dischargers. This special condition requires that a permittee notify the DEQ of any changes in effluent quality or the presence of certain pollutants in the effluent.

B. **Cooling Water (Part I.B.2)**

Rationale: Chemical additives may be toxics or otherwise violate the receiving stream water quality standards. Cooling water treatment chemicals or additives may not be added without first notifying the DEQ Regional Office. Upon notification, the DEQ Regional Office can determine if this activity will warrant a modification to the permit.

C. **Materials Handling/Storage (Part I.B.3)**

Rationale: 9 VAC 25-30-50A prohibits the discharge of any wastes into State waters unless authorized by permit. The Code of Virginia § 62.1-44.16 and 62.1-44.17 authorized the Board to regulate the discharge of industrial waste or other waste.

D. **Operations and Maintenance Manual Requirement (Part I.B.4)**

Rationale: The Code of Virginia Section 62.1-44.16, VPDES Permit Regulation, 9 VAC 25-31-190 E, and 40 CFR 122.41(e) require proper operation and maintenance of the permitted facility. Compliance with an approved manual ensures these requirements are met.

E. **Compliance Reporting (Part I.B.5)**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, Subpart 130.4. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

F. **Total Maximum Daily Load (TMDL) Reopener (Part I.B.6)**

Rationale: Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

G. **Closure Plan (Part I.B.7)**

Rationale: This condition establishes the requirement to submit a closure plan for the treatment facility if the treatment facility is being replaced or is expected to close. This requirement is necessary to ensure industrial sites and treatment works are properly closed so that the risk of untreated wastewater discharge, spills, leaks, and exposure to raw materials is eliminated and water quality is maintained. Section 62.1-44.21 requires every owner to furnish requested plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from this discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.

H. **Permit Application Requirement (Part I.B.8)**

Rationale: The VPDES Permit Regulation (9 VAC 25-31-100 D) and 40 CFR 122.21(d)(1) require submission of a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation (9 VAC 25-31-100

E.1) and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before recciving a complete application.

I. **Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

20. **NPDES Permit Rating Worksheet:** Total Score: 50
In accordance with the VPDES Permit Manual, the NPDES Permit Rating Worksheet has been completed, and this facility has been classified as an industrial minor. The completed worksheet is found in **Attachment J**.

21. **Changes to the Permit:**

A. **The following special conditions have been added to the permit:**

1. In accordance with the VPDES Permit, a Closure Plan Special Condition (Part I.B.7) has been added to require that a plan be submitted in the event that the facility is closure and treatment units are taken out of operation.

2. A Permit Application Requirement Special Condition (Part I.B.8) has been added to provide the specific due date for the required submittal of the application.

B. **Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)**

1. The Cooling Water Special Condition (Part I.B.2) has been revised to remove reference to boilers which are not applicable to this permit.

2. The Operations and Maintenance Manual Special Condition has been revised to no longer require submittal of the Manual for approval (Part I.B.4).

3. The Compliance Reporting Special Condition (Part I.B.7) has been revised to include information about significant figures and reporting requirements.

4. In accordance with the VPDES Permit Manual, boilerplate permit pages (Part II) have been revised to reflect changes in the VPDES permit regulations regarding signatory requirements.

C. **Permit Limits and Monitoring Requirements:** No changes have been made to the permit limits and monitoring requirements.

22. **Variances/Alternate Limits or Conditions:** There are no variances or alternate limits associated with this permit. In the previous permit term, a testing waiver for ammonia as N and BOD_5 was requested due to the minimal process to which this water is subject. Grab sample

testing in lieu of 24-hour composite sample testing was requested for BOD_5, COD, TOC, TSS, ammonia as N, copper, and lead due to the intermittent character of the discharges from outfall 001 and 002. Also, testing of required metals in dissolved form rather than total recoverable form was requested. This waiver was requested because the water quality standards are written in dissolved form. The requested waivers were granted in the previous permit term and have been carried forward for this reissuance application.

23. **Public Notice Information required by 9 VAC 25-31-290 D:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia DEQ
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019
540-562-6700
becky.france@deq.virginia.gov

Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address, and telephone number of the writer and all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the DEQ will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Blue Ridge Regional Office in Roanoke by appointment. A copy of the public notice is found in **Attachment K**.

24. **303(d) Listed Segments (TMDL):** This facility discharges to the Smith River. The stream segment receiving the effluent is listed on the current 303(d) list due to exceedances of the DEQ 0.3 ppm methyl mercury fish tissue value. However, the Virginia Department of Health (VDH) level of concern for mercury in fish is 0.5 ppm. The VDH has not issued a fish consumption advisory for this waterbody. A bacteria TMDL has been established for the Smith River watershed. Philpott Dam Hydroelectric Plant was identified as a discharger into the watershed but is not expected to contribute to the bacteria impairment of the watershed. So, a wasteload allocation has not been assigned to the discharges from Philpott Dam Hydroelectric Plant and *E. coli* monitoring has not been included in the permit.

25. **Additional Comments:**

Reduced Effluent Monitoring: In accordance with Guidance Memo 98-2005, all permit applications received after May 4, 1998, are considered for reduction in effluent monitoring frequency. Only facilities having exemplary operations that consistently meet permit requirements may qualify for reduced monitoring. To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any Warning Letters, Letter of Noncompliance (LON) or Notices of Violation (NOV), or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years. The facility has not received any NOVs and warning letters within the past three years. So, this facility is eligible for a reduced monitoring evaluation.

Quarterly monitoring is required for outfall 001. The VPDES Permit Manual indicates that there are no reduced monitoring provisions for quarterly monitored parameters because there are not enough data for a reduced monitoring evaluation. Annual flow monitoring and monthly temperature monitoring during the months of June through September are required for outfall 002. Due to the short monitoring period during the year and the need for temperature data for the reissuance wasteload allocation calculations, temperature is not considered for reduced monitoring. Therefore, there are no parameters where reduced monitoring is applicable for this permit.

B. **Previous Board Action:** None

C. **Staff Comments:** The discharge is not controversial. The discharge is not addressed in any planning document but will be included, if applicable, when the plan is updated. The Virginia Department of Health commented on the application noting that the raw intake for the Henry County Public Service Authority's Upper Smith River Waterworks is located approximately 3.6 miles downstream from the discharge.

D. **Public Comments:** No comments were received during the public comment period.

E. **Tables:**

Table I	Discharge Description (Page 2)
Table II	Basis for Monitoring Requirements (Pages 13-14)

F. **Attachments:**

A. Flow Frequency Memorandum
B. Water Flow Schematic
C. Site Inspection Report
D. USGS Topographic Map
E. Ambient Water Quality Information
   - STORET Data (4ASRE043.54)
   - 2012 Impaired Waters Summary (Excerpt)

- Bacteria TMDL Development for Dan River … Smith River Watersheds (Excerpt)

F. Endangered Species Information
G. Effluent Data
H. Outfall 001 --Wasteload Calculations
   - Mixing Zone Outputs (MIXER 2.1)
   - Wasteload Allocation Spreadsheet
I. Outfall 002 -- Wasteload Calculations
   - Mixing Zone Outputs (MIXER 2.1)
   - Wasteload Allocation Spreadsheet
J. NPDES Permit Rating Worksheet
K. Public Notice

Table II-1
BASIS FOR LIMITATIONS – INDUSTRIAL

( ) Interim Limitations
(x) Final Limitations

OUTFALL: 001
30 Max Ave: 0.15 MGD

Effective Dates - From: Effective Date
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/ 3 Months	Estimate
pH (S.U.)	1	NA	6.0	NA	9.0	1/ 3 Months	Grab
Oil and Grease	2	NA	NA	NA	15 mg/L	1/3 Months	Grab

NA = Not Applicable
NL = No Limitations; monitoring only

The basis for the limitations codes are:
1. Water Quality Criteria
2. Best Professional Judgment

Table II -2
BASIS FOR LIMITATIONS – INDUSTRIAL

( ) Interim Limitations
(x) Final Limitations

OUTFALL: 002
30 Day Max Ave: 0.767 MGD

Effective Dates - From: Effective Date
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/Year	Estimate
Temperature	1	NA	NA	NA	20 °C	1/Month (between June - September)	Immersion Stabilization

NA = Not Applicable
NL = No Limitations; monitoring only

The basis for the limitations codes are:
1. Water Quality Criteria
2. Best Professional Judgment

Attachment A

Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
3019 Peters Creek Road Roanoke, Virginia 24017

SUBJECT: Flow Frequency Determination
Philpott Dam Hydroelectric Plant – Reissuance (VA0090310)

TO: Permit File

FROM: Becky L. France, Water Permit Writer

DATE: May 22, 2014

This memorandum supersedes the July 29, 2009 flow frequency memorandum concerning the subject VPDES permit.

Philpott Dam Hydroelectric Plant discharges (outfalls 001 and 002) to the Smith River below the dam. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

The USGS has operated a continuous record gauge on the Smith River near Philpott, Virginia (#02072000) since 1947. Flow at the gauge has been regulated since 1951. The flow frequencies for the gauge are based on the regulated period of record. This gauge was used to determine the flow in the Smith River below Philpott Dam. The flow frequencies for the discharge points were determined using drainage area proportions but do not address any withdrawals, discharges, or springs lying between the dam and the discharge points. The high flow months are March through June. Flow frequencies are listed on the attached table.

SITEID	NAME	RECORD	LATLONG	QUAD	DAAREA	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	HFMTHS	STATPERIOD	YRSTRN	NOTES
02072000 Smith River	Smith River below Philpott Dam, near Philpott, VA	R, 1946-	Lat 36 46'50", Long 80 01'29", NAD 83	Philpott Reservoir	215	114	89	79	34	87	73	62.7	30.6	26	MAR-JUN	1951-2011	2012	Regulated Period, 1951 to current year, CD missing 2000 WY??

Flow Frequency Determination: Philpott Dam Hydroelectric Plant

Reference Gauge (data from 1951 to 2011)
Smith River near Philpott, VA (#02072000)
Drainage Area [mi^2] = 215

	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	30.6	20	High Flow 1Q10 =	34	22
7Q10 =	62.7	41	High Flow 7Q10 =	79	51
30Q5 =	87	56	HM =	114	74
30Q10=	73	47	High Flow 3010=	89	58

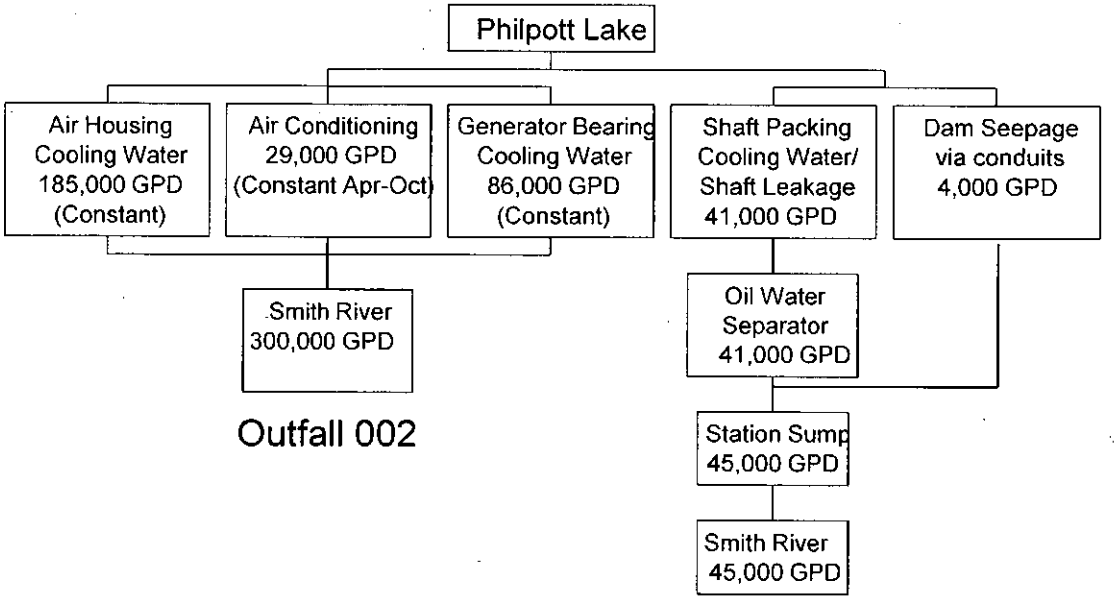
Flow frequencies for the reissued permit (12/1/14)
Smith River at Philpott Dam
Drainage Area [mi^2] = 215.25

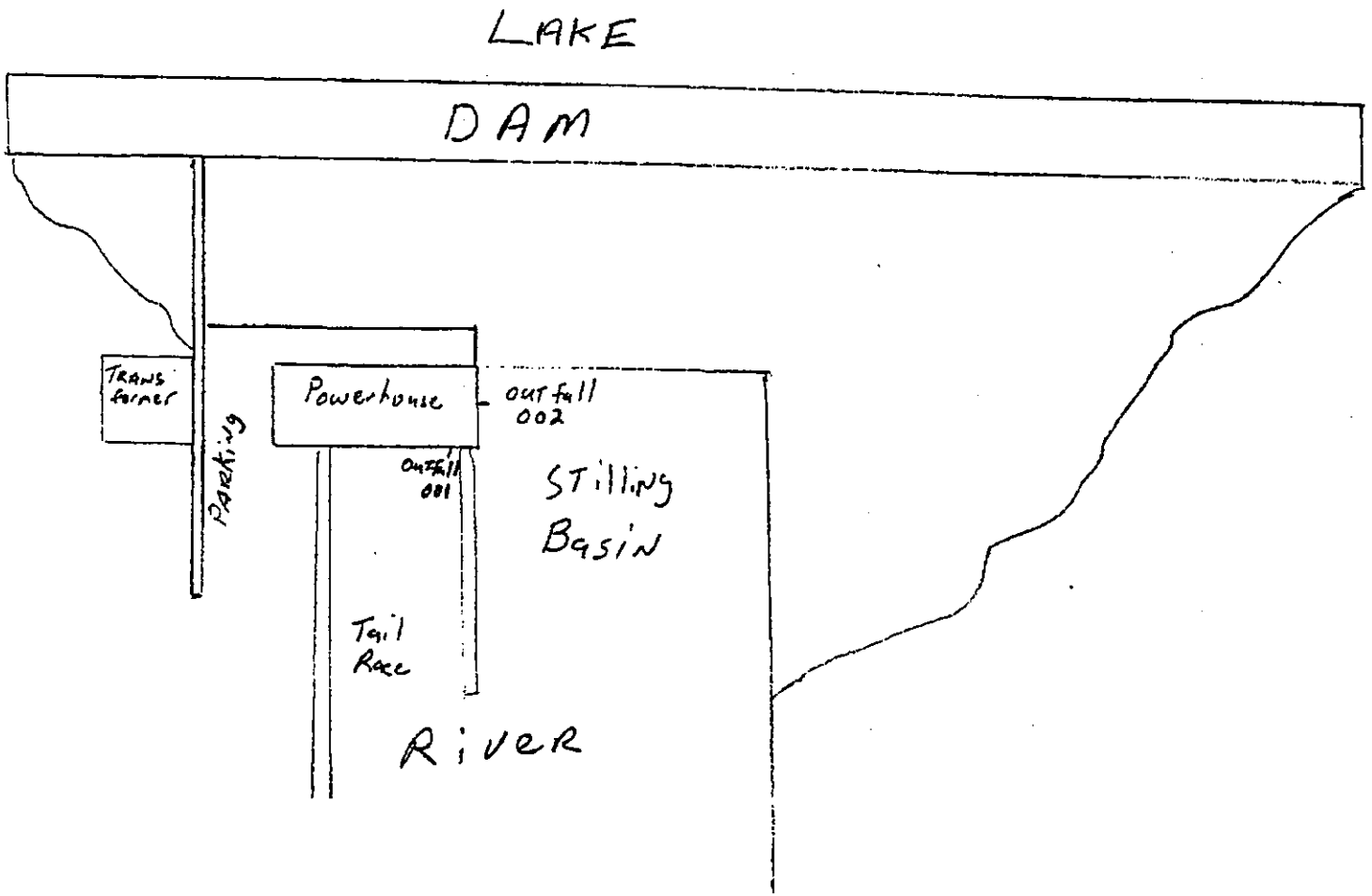
	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	**31**	**20**	**High Flow 1Q10 =**	**34**	**22**
7Q10 =	**63**	**41**	**High Flow 7Q10 =**	**79**	**51**
30Q5 =	**87**	**56**	**HM =**	**114**	**74**
30Q10=	**73**	**47**	**High Flow 30Q10=**	**89**	**58**

Attachment B

Water Flow Schematic

Water Flow from Intake to Outfall




LAKE
DAM
TRANS former
Penstock
Powerhouse
outfall 002
outfall 001
STilling Basin
Tail Race
River

Attachment C

Site Inspection Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Site Inspection Report for Philpott Dam Hydroelectric Plant
Reissuance of VPDES Permit No. VA0090310

TO: Permit File

FROM: Becky L. France, Water Permit Writer BLF

DATE: May 5, 2014

On April 29, 2014 a site visit was conducted on the Philpott Dam Hydroelectric Plant. Mary Gardner, Conservation Biologist; Jack Brendle, Plant Manager; and Brian Stuart, Park Ranger, were present. The facility is located along Dam Spillway Road in Bassett,Virginia.

In 2012 a new transformer was installed at the facility. The dirt around the transformer has been lined with a watertight membrane and there is secondary containment. The transformer is rated at <50 ppm for PCBs by the manufacturer.

Determination of Stream Uses/ Description of Receiving Waters
Water that passes through the plant is discharged above and below the river surface. There are two outfalls associated with the operation of the hydroelectric plant. The Smith River is used for recreation and has been designated as a public drinking water supply and trout stream. Flow from Philpott Dam is monitored to maintain an instream flow of 30 cfs.

Familiarization with Plant Operations
Philpott Dam Hydroelectric Plant began generating power in 1953. Water from Philpott Lake passes through the penstock to the wicket gates and turbine and enters the river through the draft tubes for all three generators. The main turbine units are each rated at 6,700 KW. The secondary unit is rated at 600 KW and is capable of maintaining the minimum regulated flow of 30 cfs. Intake water is withdrawn from the midpoint of the lake. This raw water passes through trash racks which are designed to collect any logs and large debris. All the air compressors are air cooled.

Face drains collect lake water from cracks in the dam. This water is routed out of the dam to the storm water drain and then to the tailrace where the water is discharged. Since this outfall does not contain process water it is not regulated.

Outfall 001 consists of shaft packing cooling water, shaft leakage, ground water, and dam seepage.

The packing box is a chamber surrounding a rotating member (the turbine shaft) that contains pliable sealing material to prevent the influx of water from the wet side of the system to the dry side of the headcover in the turbine pit. Water is supplied to the packing to lubricate and cool it. The wheel gate pit collects shaft packing cooling water, turbine bearing noncontact cooling water, and shaft leakage; and this water is directed to an oil/water separator. The permittee installed prefilters to remove sediment prior to the oil/water separator. Water from the oil/water separator flows into the penstock gallery trough where it combines with dam seepage from conduits. A rotating belt skims oil from the penstock gallery trough before it enters the station sump. Oil skimmed from the oil/water separator is pumped to a 55 gallon drum which has containment. The station sump also receives ground water from floor drains and dam seepage (which runs through the skimmer first).

All water leaving the station sump is filtered before being discharged to the tailrace. However, the permittee has determined that the filter is generally not necessary and there are plans to take the filter out of service. The station sump has three pumps that operate with a float mechanism that runs when the water reaches a predetermined level in the sump. The three pumps have water lubricated bearings. This intermittent discharge is associated with the generation of power which varies greatly and generally occurs no more than 5 days a week.

The draft tube is the last section of penstock before the tailrace. Water is discharged from the draft tube during routine maintenance which occurs once per year.

A concrete drainage trench within the dam (sluice gate gallery) collects ground water from floor drains and dam condensate. This ground water goes to the dam sump and then directly to the station sump. Conduits collect lake water seepage from the dam. This water flows through a trough which continues around the chemical storage room and then into the penstock galley trough. A skimmer is located in this trough. Skimmed water flows into the station sump.

Outfall 002 consists of noncontact cooling water used for the air conditioning, air housing, and generator bearings.

The air conditioning cooling water is passed through a copper coil and used to cool air being passed over it. This air conditioning system services the main office, control room, kitchen, and locker room.

Each turbine generator has an upper guide bearing and thrust bearing (which is located at the point where the rotor rests on the support structure allowing for unencumbered rotation of the shaft), and these bearings are water-cooled. The purpose of the bearing cooler is to lower elevated lubricating oil temperatures caused by friction between the bearing and the rotor. The transfer of heat is accomplished by passing the heated oil over a series of cooling coils containing service water taken from Philpott Lake. Noncontact cooling water that cools the turbine bearings is discharged through three draft tubes to the stilling basin. The stilling basin is located near the base of the dam, to calm flood water released through the sluice gates and over the spillway before it enters the river bed.

Water from the lake is passed through heat exchangers located within the generator housing within the wheel pit. The air housing coolers absorb heat generated as a rotor of the generator turns. There is no air housing cooling water associated with the secondary generator. This noncontact cooling water is discharged directly to the stilling basin below the surface of the water.

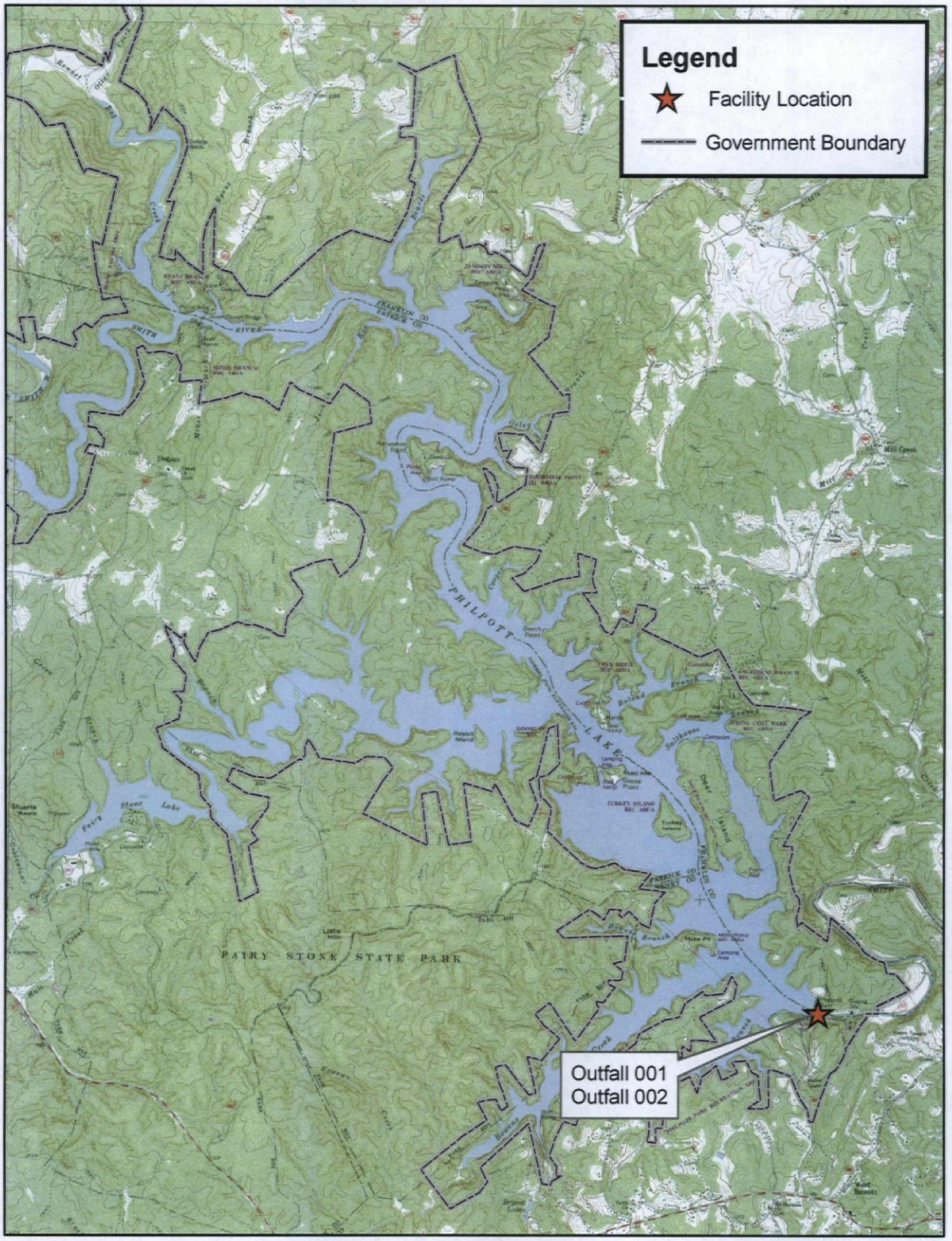
Materials Storage

Batteries with muriatic acid are housed in a room as an emergency backup. One room has been designated for storage of lubricating oil, grease, 5 gallon cans of oil, small quantities of paint, paint thinner, WD-40, cleaners, and absorbent materials. The storage room also has five 55-gallon drums of lubricating oil with secondary containment. Any spills in this room could be discharged through a floor drain or collected in a trough located along two sides of the room and routed to through the penstock galley trough (with skimmer) to the station sump.

Attachment D

USGS Topographic Map

Philpott Dam Hydroelectric Plant
VPDES Permit No. VA0090310
Facility Location Map



US Army Corps of Engineers
Wilmington District

0 0.5 1 2 Miles

N

Attachment E

Ambient Water Quality Information

- STORET Data (4ASRE043.54)
- 2012 Impaired Waters Summary (Excerpt)
- Bacteria TMDL Development for Dan River… Smith River Watersheds (Excerpt)

4ASRE043.54
VAW-L52R

Collection Date Time	Temp (°C)	pH (S.U.)
02/10/2004 11:00	5.5	7.4
04/05/2004 11:30	7.8	7.3
06/02/2004 12:00	10.1	7
08/02/2004 13:00	12.8	7.7
10/06/2004 12:00	12.6	7.7
12/08/2004 12:00	12.3	7.8
02/14/2005 13:10	8.08	7.23
04/21/2005 12:00	8.5	7.35
06/09/2005 12:00	12.4	7.8
08/09/2005 10:00	11.6	8.2
10/12/2005 10:00	12	8.1
12/21/2005 10:00	8.1	8.3
04/10/2006 10:00	8.1	7.7
06/08/2006 10:00	11	8.2
08/30/2006 10:30	12.7	8.3
10/05/2006 11:00	13	8
12/19/2006 10:00	8.2	7.3
02/21/2007 10:30	6.6	7.5
06/20/2007 10:00	11.7	5.1
08/02/2007 10:30	12.3	5.9
10/18/2007 10:30	12.5	5.9
12/18/2007 10:00	9.8	7.2
02/28/2008 11:00	6.3	6.4
04/09/2008 09:30	7.9	6.8
06/24/2008 10:30	13.4	6.2
08/28/2008 10:30	11.4	7.4
10/28/2008 11:00	11	6.8
12/22/2008 12:00	3	6.5
01/14/2009 13:00	6.7	6.8
03/24/2009 12:30	8.6	7.1
05/07/2009 11:00	10.2	6.7
07/15/2009 11:00	11.1	7
09/08/2009 13:00	15.2	6.6
11/16/2009 11:30	14.2	7.5
01/25/2010 12:00	8.4	7
03/18/2010 12:30	8.9	7.3
05/04/2010 12:30	11.4	7.3
07/06/2010 12:00	12.3	7.9
09/02/2010 13:00	11.9	8.3
11/09/2010 11:00	10.3	6.8
02/17/2011 12:30	9.1	7.4
04/07/2011 12:00	9.6	8.6
06/23/2011 12:30	12.2	7.7
08/23/2011 12:00	14	7.5
10/11/2011 11:00	13.8	7.5
12/08/2011 11:30	11.2	7
02/15/2012 11:30	8.7	7.6
03/08/2012 12:30	9.4	7.5
05/08/2012 11:30	11.5	7.4

90th Percentile pH	8.2 S.U.
10th Percentile pH	6.6 S.U.
90th Percentile Temp	14 °C
90th Percentile Temp (March - June)	12 °C

4ASRE043.54
VAW-L52R

Collection Date Time	Temp (°C)	pH (S.U.)
07/26/2012 12:30	15.5	7.5
09/11/2012 11:00	13.3	7.9
11/15/2012 11:00	10	7.6
02/27/2013 10:35	6.2	7.7
04/03/2013 09:50	6.8	7.5
06/13/2013 10:40	9.7	8.4
08/06/2013 09:55	14.3	7.8
10/01/2013 10:00	16.8	7.6
12/11/2013 09:45	10.3	7.4
01/09/2014 10:35	7.6	7.5
03/24/2014 15:15	8.9	7.6

VAW-L52R
4ASRE043.54

Collection Date Time	Hardness, Total (mg/L as $CaCO_3$)
1/21/1999 8:20	20
2/11/1999 8:20	28
3/29/1999 8:45	20
4/19/1999 9:00	24
5/19/1999 14:00	22
6/16/1999 9:10	26.8
7/27/1999 8:15	29.7
8/26/1999 8:40	31.8
9/27/1999 13:00	19.9
10/21/1999 9:45	20.2
12/8/1999 9:10	21.1
1/12/2000 13:50	31.3
2/23/2000 9:15	22
3/22/2000 9:05	23
4/5/2000 8:45	22
5/23/2000 8:55	26
6/21/2000 9:25	24.2
7/20/2000 10:00	26
8/7/2000 11:00	23.7
10/19/2000 11:00	20
11/13/2000 15:00	17.2
12/7/2000 10:30	20.3
1/9/2001 10:00	20.8
2/8/2001 10:00	22.7
3/8/2001 10:00	9
4/9/2001 10:00	6.8
5/15/2001 10:00	20.5
6/12/2001 10:00	10.9
7/26/2001 12:30	37.1
9/4/2001 13:30	17.8
9/24/2001 11:30	12
10/24/2001 11:30	30.5
11/29/2001 13:00	19.8
12/17/2001 12:30	27.3
1/10/2002 13:00	18.9
2/26/2002 11:30	32
3/14/2002 13:00	20.4
4/4/2002 12:00	19.4
5/15/2002 12:30	25.1
6/10/2002 11:00	23.5
7/16/2002 13:50	21.4
8/20/2002 10:45	37.3
9/19/2002 14:15	20.9
10/22/2002 12:10	22.5
11/18/2002 15:00	18.8
12/19/2002 12:00	20.3
2/3/2003 13:00	21.3
2/25/2003 12:00	21.1
3/11/2003 13:30	20.1
4/23/2003 12:30	19.4
6/4/2003 12:00	23.5

Mean Hardness **22** **mg/L**

Water quality standards written for minimum hardness of 25 mg/L.

Roanoke and Yadkin River Basins

Cause Group Code: **L51L-01-HG** **Philpott Reservoir**

Location: Philpott Reservoir

City / County: Franklin Co. Henry Co. Patrick Co.

Use(s): Fish Consumption

Cause(s) /
VA Category: Mercury in Fish Tissue/ 5A

This initial 2010 303(d) Listing is based on 2007 fish tissue collections and new Water Quality Standards effective 2/01/2010. Mercury (Hg) exceedances of the DEQ 0.3 parts per million (ppm) tissue value cause impairment of the Fish Consumption Use. No VDH Fish Consumption or Drinking Water Advisories are issued for mercury for these waters. The Virginia Department of Health (VDH) level of concern is 0.5 ppm. Please visit http://www.deq.virginia.gov/info/mercury.html for more information about mercury contamination and http://www.vdh.virginia.gov/Epidemiology/dee/PublicHealthToxicology/Advisories/ for VDH Advisories or Bans.

4ASRE046.90 (Above Philpott Dam)- 2007 fish tissue analysis finds exceedances of the WQS based tissue value (TV) for mercury (Hg) of 0.3 ppm in three individual largemouth bass (size 41.8 cm) at 0.59 ppm, (size 40.9 cm) at 0.563 ppm and (size 33.2 cm) at 0.374 ppm. There are no additional data within the 2012 data window.

Philpott Reservoir **Fish Consumption**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Mercury in Fish Tissue - Total Impaired Size by Water Type:		**2,813.42**	

Sources:

Source Unknown

Bacteria TMDL Development for the Dan River, Blackberry Creek, Byrds Branch, Double Creek, Fall Creek, Leatherwood Creek, Marrowbone Creek, North Fork Mayo River, South Fork Mayo River, Smith River, Sandy Creek, and Sandy River Watersheds

Submitted by

Virginia Department of Environmental Quality

Prepared by

GEORGE MASON UNIVERSITY

and

THE Louis Berger Group, INC.

2445 M Street, NW
Washington, DC 20037

September 2008

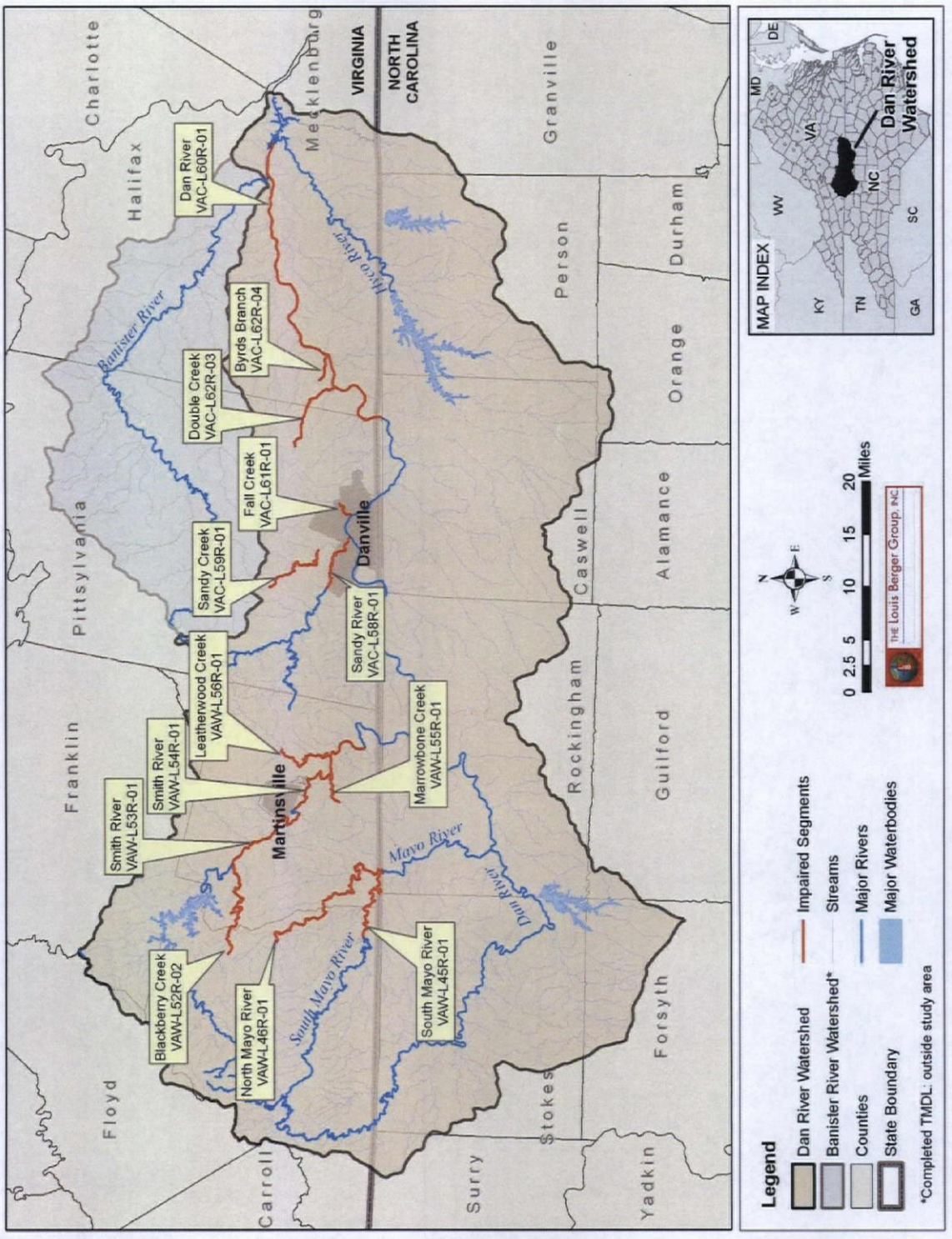


Figure 1-1: Location of Bacteria Impaired Segments of the Dan River Watershed

The waste water treatment plants use chlorine for disinfection, and so use total residual chlorine as a surrogate for bacteria limits. Compliance with the chlorine contact requirements has been shown to translate to compliance with the bacteria criteria, and *E. coli* limitations are therefore not required.

Table 3-14: Individual Permitted Facilities within the Dan River Watershed, Virginia

Permit No	Facility Name	Receiving Stream	Status	Size	Category	Design Flow (GPD)
VA0052841	Colonial Pipeline Co - Witt Station	Fall Creek, UT	Active	Minor	Industrial	0.0059
VA0001627	Corning Inc - Danville	Rutledge Creek	Active	Minor	Industrial	0.692
VA0074586	Country Oaks LLC STP	Sandy Creek	Active	Minor	Municipal	0.03
VA0060593	Danville City - Northside	Dan River	Application	Major	Municipal	24
VA0001201	Goodyear Tire & Rubber Co - Danville	Hogans Creek, UT1	Active	Minor	Industrial	0.13
VA0022705	Halifax County Schools Cluster Springs Elem	Stokes Creek/U.T.	Active	Minor	Municipal	0.0051
VA0027685	Pittsylvania Co - Dan River High School	Little Fall Creek, UT	Active	Minor	Municipal	0.0104
VA0027693	Pittsylvania Co - Tunstall High School	Stewart Creek, UT	Active	Minor	Municipal	0.012
VA0089893	South Boston WTP	Poplar Creek	Active	Minor	Industrial	0.04
VA0020362	South Boston WWTP	Dan River	Active	Major	Municipal	2
VA0001554	Hanesbrands Incorporated	Smith River	Active	Major	Industrial	0.3881
VA0021989	Virginia Glass Products Corp	Machine Branch, UT	Active	Minor	Industrial	0.008
VA0023558	DOC - Patrick Henry Correctional Unit 28	Jennings Creek, UT	Active	Minor	Municipal	0.028
VA0025305	Martinsville City Sewage Treatment Plant	Smith River	Active	Major	Municipal	8
VA0029858	Carver Estates - Sewage Treatment Plant	Grassy Creek	Active	Minor	Municipal	0.06
VA0030660	DCR - Fairy Stone State Park	Hale Creek	Active	Minor	Industrial	0.0005
VA0058441	Upper Smith River Water Filtration Plant	Smith River, UT	Active	Minor	Industrial	0.096
VA0060445	Henry County Public SA - Piedmont Estates Lagoon	Mill Creek	Active	Minor	Municipal	0.04
VA0069345	Henry County PSA - Lower Smith River STP	Smith River	Active	Major	Municipal	4
VA0072354	CPFilms Inc - Plant 1	Smith River	Active	Minor	Industrial	4.2
VA0086665	Bassett Mirror Company Incorporated	Town Creek	Active	Minor	Industrial	0.0035
VA0090174	Green Acres Mobile Home Park	Tanyard Branch	Active	Minor	Municipal	0.01
VA0090280	Henry County Public SA - Greenbriar Lagoon STP	Grassy Creek	Active	Minor	Municipal	0.032
VA0090310	Philpott Dam Hydroelectric Plant	Smith River	Active	Minor	Industrial	0.0638

The impaired segment of the South Fork Mayo River (VAW-L45R-01) extends for 10.86 miles from the mouth of Spoon Creek extending downstream to the Virginia-North Carolina state line. This segment is listed on the 2004 305(b)/303(d) Water Quality Assessment Integrated Report with a bacteria impairment. Between January 1, 1998 and December 31, 2002, station 4ASMR004.14 recorded 2 out of 16 samples (13%) as exceeding the instantaneous fecal coliform bacteria criterion of 400 (cfu/100mL).

The impaired segment of Sandy Creek (VAC-L59R-01), first listed in 2004, extends for 9.17 miles from its headwaters downstream to its confluence with Little Sandy Creek. This segment is impaired for fecal coliform. Between January 1, 1998 and December 31, 2002, at the listing station (ASCR007.06), 5 out of 25 samples (20%) collected exceeded the instantaneous fecal coliform bacteria standard of 400 (cfu/100mL).

The impaired segment of the Sandy River (VAC-L58R-01) was first listed on the 2002 305(b)/303(d) Water Quality Assessment Integrated Report. This segment of the Sandy River is impaired for fecal coliform for 7.21 miles, beginning at the Hickory Forest Creek mouth and extending downstream to the confluence of the Dan River. Between January 1, 1998, and December 31, 2002, 7 out of 25 samples (28%) collected at the listing station (4ASRV000.20) exceeded the instantaneous fecal coliform bacteria standard of 400 (cfu/100mL).

Two segments of the Smith River were identified as impaired for bacteria on VA DEQ's 2004 305(b)/303(d) Water Quality Assessment Integrated Report. Segment VAW-L54R-01, the downstream segment extending fro 13.77 miles from the Martinsville Dam to the mouth of Turkey Pen Branch, was first listed as impaired in the 2002 305(b)/303(d) Water Quality Assessment Integrated Report. Two stations recorded violations for this segment of the Smith River. Each station, 4ASRE021.58 and 4ASRE015.43, recorded 6 out of 35 (17%) sample violations between January 1, 1998 and December 31, 2002. The upstream impaired segment of the Smith River (VAW-L53R-01) is 6.95 miles long extending from the mouth of Reed Creek to the backwaters of the Martinsville Dam. Between January 1, 1998 and December 31, 2002, 9 of 59 samples (15%) collected at the listing station (4ASRE033.19) exceeded the fecal coliform instantaneous criterion of 400 cfu/100 mL.

The impaired segment of the Sandy River (VAC-L58R-01) was first listed on the 2002 305(b)/303(d) Water Quality Assessment Integrated Report. This segment of the Sandy River is impaired for fecal coliform for 7.21 miles, beginning at the Hickory Forest Creek mouth and extending downstream to the confluence of the Dan River. Between January 1, 1998, and December 31, 2002, 7 out of 25 samples (28%) collected at the listing station (4ASRV000.20) exceeded the instantaneous fecal coliform bacteria standard of 400 cfu/100 ml.

Two segments of the Smith River were identified as impaired for bacteria on VA DEQ's 2004 305(b)/303(d) Water Quality Assessment Integrated Report. Segment VAW-L54R-01, the downstream segment, extending for 13.77 miles from the Martinsville Dam to the mouth of Turkey Pen Branch, was first listed as impaired in the 2002 305(b)/303(d) Water Quality Assessment Integrated Report. Two stations recorded violations for this segment of the Smith River. Each station (4ASRE021.58 and 4ASRE015.43) recorded 6 out of 35 (17%) sample violations between January 1, 1998 and December 31, 2002. The upstream impaired segment of the Smith River (VAW-L53R-01) is 6.95 miles long extending from the mouth of Reed Creek to the backwaters of the Martinsville Dam. Between January 1, 1998 and December 31, 2002, 9 of 59 samples (15%) collected at the listing station (4ASRE033.19) exceeded the fecal coliform instantaneous criterion of 400 cfu/100 ml.

The total length of these 13 segments is approximately 140 miles. **Table 1-1** summarizes the details of the impaired segments and **Figure 1-1** presents their location.

Attachment F

Endangered Species Information

France, Becky (DEQ)

From: Aschenbach, Ernie (DGIF)
Sent: Friday, June 27, 2014 2:55 PM
To: France, Becky (DEQ); Hillman, Brett; nhreview (DCR)
Cc: ProjectReview (DGIF); Cason, Gladys (DGIF)
Subject: RE: ESSLog 34447; VPDES reissuance VA0090310 Philpott Dam Hydroelectric Plant non-contact and contact cooling water release into Smith River near Bassett, VA

We reiterate our existing recommendations.

Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
P.O. Box 11104
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

From: Aschenbach, Ernie (DGIF)
Sent: Thursday, January 23, 2014 2:28 PM
To: France, Becky (DEQ); Hillman, Brett; nhreview (DCR)
Cc: ProjectReview (DGIF); Cason, Gladys (DGIF)
Subject: ESSLog 34447; VPDES reissuance VA0090310 Philpott Dam Hydroelectric Plant non-contact and contact cooling water release into Smith River near Bassett, VA

We have reviewed the application for VPDES reissuance for the above-referenced facility. The receiving water is the Smith River 7Q10 of 39 million gallons per day (MGD). The facility has a daily (Design Flow) flow at discharge 001 (contact cooling water) of 0.15 MGD, and discharge 002 (noncontact cooling water) of 0.767 MGD.

According to our records, Smith River is a designated Threatened and Endangered (T&E) species water for the federal Endangered state Endangered (FESE) Roanoke logperch, and state Threatened (ST) orangefin madtom. This reach of the Smith River is also designated wild brown trout waters. We support adherence to the Technology and Water Quality Based Limitations identified in the application. Provided the applicant adheres to the effluent characteristics identified in the permit application, we do not anticipate the issuance of this permit to result in adverse impact to designated T&E species waters or their associated species.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend and support coordination with VDCR-DNH regarding the protection of these resources. We also recommend contacting the USFWS regarding all federally listed species.

Thank you for the opportunity to provide comments. Please call me if you have any questions.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
P.O. Box 11104
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

France, Becky (DEQ)

From: nhreview (DCR)
Sent: Tuesday, August 27, 2013 6:48 PM
To: France, Becky (DEQ)
Cc: ProjectReview (DGIF); brett_hillman@fws.gov; susan_lingenfelser@fws.gov
Subject: VA0090310, Philpott Dam Hydroelectric Plant
Attachments: 65122, DEQ VA0090310, Philpott Dam Hydroelectric Plant.pdf

Ms. France,

Please find attached the DCR-DNH comments for the above referenced project. The comments are in pdf format and can be printed for your records. Also species rank information is available at http://www.dcr.virginia.gov/natural_heritage/help.shtml for your reference.

Thank you for the opportunity to comment on this project.

S. Rene' Hypes
Project Review Coordinator
Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, Virginia 23219
804-371-2708 (phone)
804-371-2674 (fax)
rene.hypes@dcr.virginia.gov

25th ANNIVERSARY 1986-2011
VIRGINIA NATURAL HERITAGE PROGRAM

Conserving VA's Biodiversity through Inventory, Protection and Stewardship
www.dcr.virginia.gov/natural_heritage
Virginia Natural Heritage Program on Facebook

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804) 786-6124

August 27, 2013

Becky France
DEQ – Southwest Regional Office
3019 Peters Creek Road
Roanoke, VA 24019

Re: VA0090310, Philpott Dam Hydroelectric Plant

Dear Ms. France:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, Berner's Ephemerella mayfly (*Ephemerella berneri*, G4/S1S3/NL/NL) has been documented downstream of the project area. Berner's Ephemerella mayfly was first described from larvae collected in Georgia and Virginia. This species is currently known from the Carolinas, Georgia, Tennessee, and Virginia (two locations). The larvae have been collected or observed from med to large rivers in the Southern Piedmont and Southern Ridge and Valley physiographic provinces of Virginia (Kondratief et al., 1981). In Virginia, the larvae have been found living on a substrate of exposed bedrock, coarse pebble, and some cobble covered by thick mats of hornleaf riverweed during warm months. Full-grown larvae float to just below the surface of the water in areas of moderate current and emerge as subimagoes (a dull, winged, preadult stage that is unique to mayflies) from early afternoon to early evening in late spring. Mayfly larvae are entirely aquatic. Species dispersal is limited by drainage systems, perturbations in water quality, and the short life span and poor dispersal abilities of the adults, especially the egg-laying females. Subimagoes and adults of mayflies are typically found perched on streamside vegetation near their emergence sites. Males gather in swarms to intercept females for mating.

Threats to Berner's Ephemerella mayfly include activities which degrade the water quality in which the larval stage lives. Because of their aquatic lifestyle and limited mobility, the larvae are particularly vulnerable to shoreline disturbances that cause the loss of shoreline vegetation and siltation. They are also sensitive to alterations, such as tree removal, erosion, or dredging, that result in poor water quality, aquatic substrate changes, and thermal fluctuations.

To minimize impacts to aquatic resources, DCR recommends the use of new technologies as they become available to maintain and improve water quality.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). According to the information currently in our files, Smith River 2, which has been designated by VDGIF as a "Threatened and Endangered Species Water" for the Roanoke logperch (*Percina rex*), is within 2 miles of the project area. Therefore, DCR recommends coordination with the United States Fish and Wildlife Service (USFWS) and the VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Should you have any questions or concerns, feel free to contact René Hypes at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Project Review Coordinator

CC: Brett Hillman, USFWS
Susan Lingenfelser, USFWS
Ernie Aschenbach, VDGIF

Literature Cited

Kondratieff, B.C.; J.W.S. Foster, J.R. Voshell, Jr. 1981. Description of the adult of Ephemerella berneri Allen and Edmunds (Ephemeroptera: Ephemerellidae) with biological notes. Proceedings of the Entomological Society of Washington 83(2):300-303. USGS, 2006. Mayflies of Virginia.
http://www.npwrc.usgs.gov/resource/distr/insects/mfly/va/194.htm

France, Becky (DEQ)

From: France, Becky (DEQ)
Sent: Tuesday, March 25, 2014 3:12 PM
To: 'Hillman, Brett'
Subject: RE: Philpott Dam Hydroelectric Plant VA0090310 - USFWS Comments

I reviewed the stream classification for the receiving stream. This classification in (9 VAC 25-260) determines the temperature standard for the stream. The receiving stream appears to be classified as VI (Natural Trout Waters in Section 3d PWS) as per the following description: Smith River from DuPont's (inactive) raw water intake upstream to the Philpott Dam, unless otherwise designed in this chapter.

According to 9 VAC 25-260-50, Class VI waters have a maximum temperature criterion of 20 °C. This water quality criterion is the basis for the maximum temperature limit in the permit.

Note that in the previous permit term the 90th percentile temperature value of the receiving stream and the effluent were each only 13 °C. We really don't have a regulatory basis for adjusting the temperature limit.

From: Hillman, Brett [mailto:brett_hillman@fws.gov]
Sent: Tuesday, March 25, 2014 12:09 PM
To: France, Becky (DEQ)
Subject: Re: Philpott Dam Hydroelectric Plant VA0090310 - USFWS Comments

Hi Becky,

Just thought I'd follow up on my comments from last month. Have you considered adjusting the max temperature limit for this discharge?

Thanks!
Brett

Brett Hillman
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Phone: 804-824-2420
Fax: 804-693-9032
Email: brett_hillman@fws.gov

On Thu, Feb 20, 2014 at 5:09 PM, Hillman, Brett <brett_hillman@fws.gov> wrote:
Hi Becky,

We have reviewed the materials you provided regarding the reissuance of the above referenced permit. The following comment is provided under

provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended.

The federally listed endangered Roanoke logperch (*Percina rex*) is known to occur in the Smith River downstream of this discharge. The logperch is considered a warm water species and typically spawns when water temperatures reach 12 to 14 degrees Celsius (Jenkins and Burkhead 1993). It is believed that cold water released from Philpott dam produces year-round cold temperatures (around 8 degrees Celsius) that may exclude the Roanoke logperch from the Smith River for approximately 4 km downstream of the dam (Krause et. al. 2005, Roberts et. al. 2013).

Given this, we believe that the Roanoke logperch would benefit from a warmer discharge from the Philpott Dam Hydroelectric Plant. As a result, we support a more relaxed maximum temperature limit, which is currently set at 20 degrees Celsius.

If you have any question or comments, please let me know.

Best regards,
Brett

References:

Jenkins, R.E., and N.M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland.

Krause C.K., T.J. Newcomb, and D.J. Orth D.J. 2005. Thermal habitat assessment of alternative flow scenarios in a tailwater fishery. River Research and Applications 21, 581-593.

Roberts, J.A., P.L. Angermeier, and E.M. Hallerman. 2013. Distance, dams and drift: what structures populations of an endangered, benthic stream fish? Freshwater Biology 58 (10): 2050-2064.

Brett Hillman
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Phone: 804-693-6694 ext. 156
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Email: brett_hillman@fws.gov

Attachment G

Effluent Data

Philpott Dam Hydroelectric Dam
VA0090310

Effluent pH Data (Outfall 001)

Date	S.U.	
	Min.	Max.
10-Apr-10	8.4	8.4
10-May-10	7.7	7.7
10-Aug-10	7.8	7.8
10-Nov-10	7.7	7.7
10-Feb-11	7.8	7.8
10-May-11	7.4	7.4
10-Aug-11	6	6
10-Nov-11	6.7	6.7
10-Feb-12	7.3	7.3
10-May-12	6.8	6.8
10-Aug-12	6.8	6.8
10-Oct-12	7	7
10-Jan-13	6.5	6.5
10-Apr-13	6.8	6.8
10-Jul-13	6.6	6.6
10-Oct-13	6.6	6.6
10-Jan-14	6.8	6.8

90th percentile value	7.8	S.U.
10th percentile value	6.6	S.U.

Philpott Dam Hydroelectric Dam
VA0090310

Oil and Grease Data (Outfall 002)

Date Due	mg/L
10-Apr-10	<QL
10-May-10	<QL
10-Aug-10	<QL
10-Nov-10	<QL
10-Feb-11	<QL
10-May-11	<QL
10-Aug-11	<QL
10-Nov-11	<QL
10-Feb-12	<QL
10-May-12	<QL
10-Aug-12	<QL
10-Oct-12	<QL
10-Jan-13	<QL
10-Apr-13	<QL
10-Jul-13	<QL
10-Oct-13	<QL
10-Jan-14	<5
10-Apr-14	<5

Philpott Dam Hydroelectric Dam
VA0090310

Effluent Temperature Data (Outfall 002)

Date Due	Temperature (°C)
10-Apr-05	6.6
10-May-05	8.2
10-Jun-05	8.3
10-Jul-05	14.1
10-Aug-05	14.1
10-Sep-05	10.6
10-Oct-05	10.5
10-Nov-05	10.5
10-Dec-05	11.3
10-Jan-06	9.9
10-Mar-06	6.9
10-Apr-06	6.8
10-May-06	7.6
10-Jun-06	8.8
10-Jul-06	9.3
10-Aug-06	13.1
10-Sep-06	11.6
10-Oct-06	11.2
10-Nov-06	11.2
10-Dec-06	8.2
10-Jan-07	7.9
10-Feb-07	9.5
10-Mar-07	6.7
10-Apr-07	6.8
10-May-07	9.8
10-Jun-07	8.9
10-Jul-07	10.9
10-Aug-07	11
10-Sep-07	19.2
10-Oct-07	13.2
10-Nov-07	12.4
10-Dec-07	14
10-Jan-08	11.8
10-Feb-08	11.6
10-Mar-08	5.1
10-Apr-08	6.9
10-May-08	8.1

Philpott Dam Hydroelectric Dam
VA0090310

Effluent Temperature Data (Outfall 002)

Date Due	Temperature (°C)
10-Jun-08	8.3
10-Jul-08	9.4
10-Aug-08	10.4
10-Sep-08	9.8
10-Oct-08	10.8
10-Nov-08	10.4
10-Dec-08	10.2
10-Jan-09	9.5
10-Feb-09	6.8
10-Mar-09	6.7
10-Apr-09	7.8
10-May-09	6.4
10-Jun-09	8.5
10-Jul-09	8.5
10-Aug-09	8.9
10-Sep-09	11.4
10-Oct-09	11.4
10-Nov-09	13.5
10-Dec-09	12.9
10-Jan-10	10.5
10-Feb-10	5.9
10-Mar-10	5.3
10-Apr-10	4.9
10-May-10	5.7
10-Jul-10	6.9
10-Aug-10	7.3
10-Sep-10	8.9
10-Oct-10	6.9
10-Nov-10	6.5
10-Dec-10	9.2
10-Jan-11	8.8
10-Jul-11	8.1
10-Aug-11	9.5
10-Sep-11	10.1
10-Oct-11	10.9
10-Jan-12	10.4
10-Jul-12	10.2
10-Aug-12	10
10-Sep-12	10.5
10-Oct-12	12
10-Jul-13	15
10-Aug-13	12.5

Philpott Dam Hydroelectric Dam
VA0090310

Effluent Temperature Data (Outfall 002)

Date Due	Temperature (°C)
10-Sep-13	9.8
10-Oct-13	15

90th percentile temperature	14 °C	Jan. - Dec.
90th percentile temperature	11 °C	March - June

Attachment H

Outfall 001 --Wasteload Calculations

- Mixing Zone Outputs (MIXER 2.1)
- Wasteload Allocation Spreadsheet
- STATS Program Output

Mixing Zone Predictions for Philpott Dam (Outfall 001) high flow

Effluent Flow = 0.15 MGD
Stream 7Q10 = 51 MGD
Stream 30Q10 = 58 MGD
Stream 1Q10 = 22 MGD
Stream slope = 0.00169 ft/ft
Stream width = 95 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.0616 ft
Length = 11108.45 ft
Velocity = .7851 ft/sec
Residence Time = .1638 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.1473 ft
Length = 10400.23 ft
Velocity = .8259 ft/sec
Residence Time = .1458 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6402 ft
Length = 17029.81 ft
Velocity = .5637 ft/sec
Residence Time = 8.3915 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 11.92% of the 1Q10 is used.

Mixing Zone Predictions for Philpott Dam (Outfall 001) low flow

Effluent Flow = 0.15 MGD
Stream 7Q10 = 41 MGD
Stream 30Q10 = 47 MGD
Stream 1Q10 = 20 MGD
Stream slope = 0.00169 ft/ft
Stream width = 90 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .962 ft
Length = 10829.29 ft
Velocity = .7357 ft/sec
Residence Time = .1704 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.0446 ft
Length = 10098.77 ft
Velocity = .7763 ft/sec
Residence Time = .1506 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .625 ft
Length = 15589.9 ft
Velocity = .5546 ft/sec
Residence Time = 7.809 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 12.81% of the 1Q10 is used.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Philpott Dam Hydroelectric Plant (Outfall 001) Permit No.: VA0090310

Receiving Stream: Smith River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	14	deg C
90% Temperature (Wet season) =	12	deg C
90% Maximum pH =	8.2	SU
10% Maximum pH =	6.6	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	y	
Trout Present Y/N? =	y	
Early Life Stages Present Y/N? =	y	

Stream Flows		
1Q10 (Annual) =	20	MGD
7Q10 (Annual) =	41	MGD
30Q10 (Annual) =	47	MGD
1Q10 (Wet season) =	22	MGD
30Q10 (Wet season)	58	MGD
30Q5 =	56	MGD
Harmonic Mean =	74	MGD

Mixing Information		
Annual - 1Q10 Mix =	12.81	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	11.92	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	14	deg C
90% Temp (Wet season) =	12	deg C
90% Maximum pH =	7.8	SU
10% Maximum pH =	6.6	SU
Discharge Flow =	0.15	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	2.5E+05	3.7E+05	--	--	6.7E+01	9.9E+01	--	--	2.5E+04	3.7E+04	--	--	**2.5E+04**	**3.7E+04**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	2.3E+03	3.5E+03	--	--	6.1E-01	9.3E-01	--	--	2.3E+02	3.5E+02	--	--	**2.3E+02**	**3.5E+02**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	2.5E+02	1.2E+03	--	--	5.1E-02	2.5E-01	--	--	2.5E+01	1.2E+02	--	--	**2.5E+01**	**1.2E+02**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	5.4E+01	--	2.4E-01	2.5E-01	7.5E-01	--	4.9E-05	5.0E-05	1.0E+02	--	2.4E-02	2.5E-02	**5.4E+01**	--	**2.4E-02**	**2.5E-02**
Ammonia-N (mg/l) (Yearly)	0	4.09E+00	1.80E+00	--	--	7.4E+01	5.7E+02	--	--	9.65E-01	4.50E-01	--	--	1.3E+02	1.4E+02	--	--	**7.4E+01**	**1.4E+02**	--	--
Ammonia-N (mg/l) (High Flow)	0	4.09E+00	1.80E+00	--	--	7.6E+01	7.0E+02	--	--	9.65E-01	4.50E-01	--	--	1.4E+02	1.7E+02	--	--	**7.6E+01**	**1.7E+02**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	3.1E+06	1.5E+07	--	--	8.3E+02	4.0E+03	--	--	3.1E+05	1.5E+06	--	--	**3.1E+05**	**1.5E+06**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	2.1E+03	2.4E+05	--	--	5.6E-01	6.4E+01	--	--	2.1E+02	2.4E+04	--	--	**2.1E+02**	**2.4E+04**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	6.1E+03	4.1E+04	3.7E+03	--	8.5E+01	3.8E+01	1.0E+00	--	1.1E+04	1.0E+04	3.7E+02	--	**6.1E+03**	**1.0E+04**	**3.7E+02**	--
Barium	0	--	--	2.0E+03	--	--	--	7.5E+05	--	--	--	2.0E+02	--	--	--	7.5E+04	--	--	--	**7.5E+04**	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	1.1E+04	2.5E+05	--	--	2.2E+00	5.1E+01	--	--	1.1E+03	2.5E+04	--	--	**1.1E+03**	**2.5E+04**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	4.3E-01	9.9E-01	--	--	8.6E-05	2.0E-04	--	--	4.3E-02	9.9E-02	--	--	**4.3E-02**	**9.9E-02**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	**1.9E+00**	**8.9E+00**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	**1.9E+00**	**8.9E+00**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	**1.9E+00**	**8.9E+00**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	**1.9E+00**	**8.9E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	1.5E+02	2.6E+03	--	--	3.0E-02	5.3E-01	--	--	1.5E+01	2.6E+02	--	--	**1.5E+01**	**2.6E+02**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	5.2E+05	2.4E+07	--	--	1.4E+02	6.5E+03	--	--	5.2E+04	2.4E+06	--	--	**5.2E+04**	**2.4E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	5.9E+03	1.1E+04	--	--	1.2E+00	2.2E+00	--	--	5.9E+02	1.1E+03	--	--	**5.9E+02**	**1.1E+03**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	2.1E+04	6.9E+05	--	--	4.3E+00	1.4E+02	--	--	2.1E+03	6.9E+04	--	--	**2.1E+03**	**6.9E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	5.6E+05	7.1E+05	--	--	1.5E+02	1.9E+02	--	--	5.6E+04	7.1E+04	--	--	**5.6E+04**	**7.1E+04**
Cadmium	0	8.2E-01	3.8E-01	5.0E+00	--	1.5E+01	1.0E+02	1.9E+03	--	2.1E-01	9.5E-02	5.0E-01	--	2.8E+01	2.6E+01	1.9E+02	--	**1.5E+01**	**2.6E+01**	**1.9E+02**	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	1.1E+03	7.9E+03	--	--	2.3E-01	1.6E+00	--	--	1.1E+02	7.9E+02	--	--	**1.1E+02**	**7.9E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	4.3E+01	1.2E+00	4.0E+00	4.0E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	8.1E+01	2.9E-01	4.0E-01	4.0E-01	**4.3E+01**	**2.9E-01**	**4.0E-01**	**4.0E-01**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.6E+07	6.3E+07	9.4E+07	--	2.2E+05	5.8E+04	2.5E+04	--	2.9E+07	1.6E+07	9.4E+06	--	**1.6E+07**	**1.6E+07**	**9.4E+06**	--
TRC	0	1.9E+01	1.1E+01	--	--	3.4E+02	3.0E+03	--	--	4.8E+00	2.8E+00	--	--	6.4E+02	7.5E+02	--	--	**3.4E+02**	**7.5E+02**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	4.9E+04	6.0E+05	--	--	1.3E+01	1.6E+02	--	--	4.9E+03	6.0E+04	--	--	**4.9E+03**	**6.0E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	2.0E+03	6.4E+04	--	--	4.0E-01	1.3E+01	--	--	2.0E+02	6.4E+03	--	--	2.0E+02	6.4E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.3E+05	4.1E+06	--	--	3.4E+01	1.1E+03	--	--	1.3E+04	4.1E+05	--	--	1.3E+04	4.1E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	3.7E+05	6.0E+05	--	--	1.0E+02	1.6E+02	--	--	3.7E+04	6.0E+04	--	--	3.7E+04	6.0E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	3.0E+04	5.6E+04	--	--	8.1E+00	1.5E+01	--	--	3.0E+03	5.6E+03	--	--	3.0E+03	5.6E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.5E+00	1.1E+01	--	--	2.1E-02	1.0E-02	--	--	2.8E+00	2.8E+00	--	--	1.5E+00	2.8E+00	--	--
Chromium III	0	1.8E+02	2.4E+01	--	--	3.3E+03	6.5E+03	--	--	4.6E+01	6.0E+00	--	--	6.1E+03	1.6E+03	--	--	3.3E+03	1.6E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.9E+02	3.0E+03	--	--	4.0E+00	2.8E+00	--	--	5.4E+02	7.5E+02	--	--	2.9E+02	7.5E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	3.7E+04	--	--	--	1.0E+01	--	--	--	3.7E+03	--	--	--	3.7E+03	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	3.8E-04	1.8E-03	--	--	1.9E-01	8.9E-01	--	--	1.9E-01	8.9E-01
Copper	0	3.6E+00	2.7E+00	1.3E+03	--	6.6E+01	7.5E+02	4.9E+05	--	9.1E-01	6.8E-01	1.3E+02	--	1.2E+02	1.9E+02	4.9E+04	--	6.6E+01	1.9E+02	4.9E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	4.0E+02	1.4E+03	5.2E+04	6.0E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	7.4E+02	3.6E+02	5.2E+03	6.0E+05	4.0E+02	3.6E+02	5.2E+03	6.0E+05
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	1.5E+00	1.5E+00	--	--	3.1E-04	3.1E-04	--	--	1.5E-01	1.5E-01	--	--	1.5E-01	1.5E-01
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	1.1E+00	1.1E+00	--	--	2.2E-04	2.2E-04	--	--	1.1E-01	1.1E-01	--	--	1.1E-01	1.1E-01
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.0E+01	2.7E-01	1.1E+00	1.1E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.7E+01	6.9E-02	1.1E-01	1.1E-01	2.0E+01	6.9E-02	1.1E-01	1.1E-01
Demeton	0	--	1.0E-01	--	--	--	2.7E+01	--	--	--	2.5E-02	--	--	--	6.9E+00	--	--	--	6.9E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	3.1E+00	4.7E+01	--	--	4.3E-02	4.3E-02	--	--	5.7E+00	1.2E+01	--	--	3.1E+00	1.2E+01	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	1.9E+00	8.9E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.6E+05	4.9E+05	--	--	4.2E+01	1.3E+02	--	--	1.6E+04	4.9E+04	--	--	1.6E+04	4.9E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.2E+05	3.6E+05	--	--	3.2E+01	9.6E+01	--	--	1.2E+04	3.6E+04	--	--	1.2E+04	3.6E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	2.4E+04	7.1E+04	--	--	6.3E+00	1.9E+01	--	--	2.4E+03	7.1E+03	--	--	2.4E+03	7.1E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	1.0E+02	1.4E+02	--	--	2.1E-02	2.8E-02	--	--	1.0E+01	1.4E+01	--	--	1.0E+01	1.4E+01
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	2.7E+03	8.4E+04	--	--	5.5E-01	1.7E+01	--	--	2.7E+02	8.4E+03	--	--	2.7E+02	8.4E+03
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	1.9E+03	1.8E+05	--	--	3.8E-01	3.7E+01	--	--	1.9E+02	1.8E+04	--	--	1.9E+02	1.8E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.2E+05	2.7E+06	--	--	3.3E+01	7.1E+02	--	--	1.2E+04	2.7E+05	--	--	1.2E+04	2.7E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	5.2E+04	3.7E+06	--	--	1.4E+01	1.0E+03	--	--	5.2E+03	3.7E+05	--	--	5.2E+03	3.7E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	2.9E+04	1.1E+05	--	--	7.7E+00	2.9E+01	--	--	2.9E+03	1.1E+04	--	--	2.9E+03	1.1E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	3.7E+04	--	--	--	1.0E+01	--	--	--	3.7E+03	--	--	--	3.7E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	2.5E+03	7.4E+04	--	--	5.0E-01	1.5E+01	--	--	2.5E+02	7.4E+03	--	--	2.5E+02	7.4E+03
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	1.7E+03	1.0E+05	--	--	3.4E-01	2.1E+01	--	--	1.7E+02	1.0E+04	--	--	1.7E+02	1.0E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	4.3E+00	1.5E+01	2.6E-01	2.7E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	8.1E+00	3.8E+00	2.6E-02	2.7E-02	4.3E+00	3.8E+00	2.6E-02	2.7E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	6.4E+06	1.6E+07	--	--	1.7E+03	4.4E+03	--	--	6.4E+05	1.6E+06	--	--	6.4E+05	1.6E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.4E+05	3.2E+05	--	--	3.8E+01	8.5E+01	--	--	1.4E+04	3.2E+04	--	--	1.4E+04	3.2E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.0E+08	4.1E+08	--	--	2.7E+04	1.1E+05	--	--	1.0E+07	4.1E+07	--	--	1.0E+07	4.1E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	7.5E+05	1.7E+06	--	--	2.0E+02	4.5E+02	--	--	7.5E+04	1.7E+05	--	--	7.5E+04	1.7E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	2.6E+04	2.0E+06	--	--	6.9E+00	5.3E+02	--	--	2.6E+03	2.0E+05	--	--	2.6E+03	2.0E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	4.9E+03	1.0E+05	--	--	1.3E+00	2.8E+01	--	--	4.9E+02	1.0E+04	--	--	4.9E+02	1.0E+04
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	5.4E+02	1.7E+04	--	--	1.1E-01	3.4E+00	--	--	5.4E+01	1.7E+03	--	--	5.4E+01	1.7E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	1.9E-05	1.9E-05	--	--	5.0E-09	5.1E-09	--	--	1.9E-06	1.9E-06	--	--	1.9E-06	1.9E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	1.8E+02	9.9E+02	--	--	3.6E-02	2.0E-01	--	--	1.8E+01	9.9E+01	--	--	1.8E+01	9.9E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	4.0E+00	1.5E+01	2.3E+04	3.3E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	7.4E+00	3.8E+00	2.3E+03	3.3E+03	4.0E+00	3.8E+00	2.3E+03	3.3E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	4.0E+00	1.5E+01	2.3E+04	3.3E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	7.4E+00	3.8E+00	2.3E+03	3.3E+03	4.0E+00	3.8E+00	2.3E+03	3.3E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	4.0E+00	1.5E+01	--	--	5.5E-02	1.4E-02	--	--	7.4E+00	3.8E+00	--	--	4.0E+00	3.8E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	2.3E+04	3.3E+04	--	--	6.2E+00	8.9E+00	--	--	2.3E+03	3.3E+03	--	--	2.3E+03	3.3E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.6E+00	9.9E+00	2.2E+01	2.2E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.9E+00	2.5E+00	2.2E+00	2.2E+00	1.6E+00	2.5E+00	2.2E+00	2.2E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.1E+02	1.1E+02	--	--	2.9E-02	3.0E-02	--	--	1.1E+01	1.1E+01	--	--	1.1E+01	1.1E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	2.0E+05	7.9E+05	--	--	5.3E+01	2.1E+02	--	--	2.0E+04	7.9E+04	--	--	**2.0E+04**	**7.9E+04**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	4.9E+04	5.2E+04	--	--	1.3E+01	1.4E+01	--	--	4.9E+03	5.2E+03	--	--	**4.9E+03**	**5.2E+03**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	4.1E+05	2.0E+06	--	--	1.1E+02	5.3E+02	--	--	4.1E+04	2.0E+05	--	--	**4.1E+04**	**2.0E+05**
Foaming Agents	0	--	--	5.0E+02	--	--	--	1.9E+05	--	--	--	5.0E+01	--	--	--	1.9E+04	--	--	--	**1.9E+04**	**--**
Guthion	0	--	1.0E-02	--	--	--	2.7E+00	--	--	--	2.5E-03	--	--	--	6.9E-01	--	--	--	**6.9E-01**	**--**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	9.4E+00	1.0E+00	3.9E-01	3.9E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.7E+01	2.6E-01	3.9E-02	3.9E-02	**9.4E+00**	**2.6E-01**	**3.9E-02**	**3.9E-02**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	9.4E+00	1.0E+00	1.9E-01	1.9E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.7E+01	2.6E-01	1.9E-02	1.9E-02	**9.4E+00**	**2.6E-01**	**1.9E-02**	**1.9E-02**
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.4E+00	1.4E+00	--	--	2.8E-04	2.9E-04	--	--	1.4E-01	1.4E-01	--	--	**1.4E-01**	**1.4E-01**
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	2.2E+03	8.9E+04	--	--	4.4E-01	1.8E+01	--	--	2.2E+02	8.9E+03	--	--	**2.2E+02**	**8.9E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	1.3E+01	2.4E+01	--	--	2.6E-03	4.9E-03	--	--	1.3E+00	2.4E+00	--	--	**1.3E+00**	**2.4E+00**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	4.5E+01	8.4E+01	--	--	9.1E-03	1.7E-02	--	--	4.5E+00	8.4E+00	--	--	**4.5E+00**	**8.4E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.7E+01	--	4.8E+02	8.9E+02	2.4E-01	--	9.8E-02	1.8E-01	3.2E+01	--	4.8E+01	8.9E+01	**1.7E+01**	**--**	**4.8E+01**	**8.9E+01**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.5E+04	4.1E+05	--	--	4.0E+00	1.1E+02	--	--	1.5E+03	4.1E+04	--	--	**1.5E+03**	**4.1E+04**
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	6.9E+03	1.6E+04	--	--	1.4E+00	3.3E+00	--	--	6.9E+02	1.6E+03	--	--	**6.9E+02**	**1.6E+03**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	5.5E+02	--	--	--	5.0E-01	--	--	--	1.4E+02	--	--	--	**1.4E+02**	**--**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	1.9E+01	8.9E+01	--	--	3.8E-03	1.8E-02	--	--	1.9E+00	8.9E+00	--	--	**1.9E+00**	**8.9E+00**
Iron	0	--	--	3.0E+02	--	--	--	1.1E+05	--	--	--	3.0E+01	--	--	--	1.1E+04	--	--	--	**1.1E+04**	**--**
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	1.7E+05	4.7E+06	--	--	3.5E+01	9.6E+02	--	--	1.7E+04	4.7E+05	--	--	**1.7E+04**	**4.7E+05**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	**--**	**--**
Lead	0	2.0E+01	2.3E+00	1.5E+01	--	3.7E+02	6.3E+02	5.6E+03	--	5.1E+00	5.8E-01	1.5E+00	--	6.8E+02	1.6E+02	5.6E+02	--	**3.7E+02**	**1.6E+02**	**5.6E+02**	**--**
Malathion	0	--	1.0E-01	--	--	--	2.7E+01	--	--	--	2.5E-02	--	--	--	6.9E+00	--	--	--	**6.9E+00**	**--**	**--**
Manganese	0	--	--	5.0E+01	--	--	--	1.9E+04	--	--	--	5.0E+00	--	--	--	1.9E+03	--	--	--	**1.9E+03**	**--**
Mercury	0	1.4E+00	7.7E-01	--	--	2.5E+01	2.1E+02	--	--	3.5E-01	1.9E-01	--	--	4.7E+01	5.3E+01	--	--	**2.5E+01**	**5.3E+01**	**--**	**--**
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.8E+04	5.6E+05	--	--	4.7E+00	1.5E+02	--	--	1.8E+03	5.6E+04	--	--	**1.8E+03**	**5.6E+04**
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	2.3E+04	2.9E+06	--	--	4.6E+00	5.9E+02	--	--	2.3E+03	2.9E+05	--	--	**2.3E+03**	**2.9E+05**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	8.2E+00	3.7E+04	--	--	7.5E-03	1.0E+01	--	--	2.1E+00	3.7E+03	--	--	**2.1E+00**	**3.7E+03**	**--**
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	**--**	**--**
Nickel	0	5.6E+01	6.3E+00	6.1E+02	4.6E+03	1.0E+03	1.7E+03	2.3E+05	1.7E+06	1.4E+01	1.6E+00	6.1E+01	4.6E+02	1.9E+03	4.3E+02	2.3E+04	1.7E+05	**1.0E+03**	**4.3E+02**	**2.3E+04**	**1.7E+05**
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	3.7E+06	--	--	--	1.0E+03	--	--	--	3.7E+05	--	--	--	**3.7E+05**	**--**
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	6.4E+03	2.6E+05	--	--	1.7E+00	6.9E+01	--	--	6.4E+02	2.6E+04	--	--	**6.4E+02**	**2.6E+04**
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	3.4E+00	1.5E+04	--	--	6.9E-04	3.0E+00	--	--	3.4E-01	1.5E+03	--	--	**3.4E-01**	**1.5E+03**
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	1.6E+04	3.0E+04	--	--	3.3E+00	6.0E+00	--	--	1.6E+03	3.0E+03	--	--	**1.6E+03**	**3.0E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	2.5E+01	2.5E+03	--	--	5.0E-03	5.1E-01	--	--	2.5E+00	2.5E+02	--	--	**2.5E+00**	**2.5E+02**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	5.1E+02	1.8E+03	--	--	7.0E+00	1.7E+00	--	--	9.4E+02	4.5E+02	--	--	**5.1E+02**	**4.5E+02**	**--**	**--**
Parathion	0	6.5E-02	1.3E-02	--	--	1.2E+00	3.6E+00	--	--	1.6E-02	3.3E-03	--	--	2.2E+00	8.9E-01	--	--	**1.2E+00**	**8.9E-01**	**--**	**--**
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	3.8E+00	3.2E-01	3.2E-01	--	3.5E-03	6.4E-05	6.4E-05	--	9.6E-01	3.2E-02	3.2E-02	--	**9.6E-01**	**3.2E-02**	**3.2E-02**
Pentachlorophenol [C]	0	5.8E+00	4.5E+00	2.7E+00	3.0E+01	1.1E+02	1.2E+03	1.3E+03	1.5E+04	1.5E+00	1.1E+00	2.7E-01	3.0E+00	2.0E+02	3.1E+02	1.3E+02	1.5E+03	**1.1E+02**	**3.1E+02**	**1.3E+02**	**1.5E+03**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	3.7E+06	3.2E+08	--	--	1.0E+03	8.6E+04	--	--	3.7E+05	3.2E+07	--	--	**3.7E+05**	**3.2E+07**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	3.1E+05	1.5E+06	--	--	8.3E+01	4.0E+02	--	--	3.1E+04	1.5E+05	--	--	**3.1E+04**	**1.5E+05**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	5.6E+03	--	--	--	1.5E+00	--	--	--	5.6E+02	--	--	--	**5.6E+02**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	1.5E+03	1.5E+03	--	--	4.0E-01	4.0E-01	--	--	1.5E+02	1.5E+02	--	--	**1.5E+02**	**1.5E+02**
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	1.9E+03	--	--	--	5.0E-01	--	--	--	1.9E+02	--	--	--	**1.9E+02**	**--**
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	1.1E+04	--	--	--	3.0E+00	--	--	--	1.1E+03	--	--	--	**1.1E+03**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	3.6E+02	1.4E+03	6.4E+04	1.6E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	6.7E+02	3.4E+02	6.4E+03	1.6E+05	**3.6E+02**	**3.4E+02**	**6.4E+03**	**1.6E+05**
Silver	0	3.2E-01	--	--	--	5.7E+00	--	--	--	7.9E-02	--	--	--	1.1E+01	--	--	--	**5.7E+00**	**--**	**--**	**--**
Sulfate	0	--	--	2.5E+05	--	--	--	9.4E+07	--	--	--	2.5E+04	--	--	--	9.4E+06	--	**--**	**--**	**9.4E+06**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	8.4E+02	2.0E+04	--	--	1.7E-01	4.0E+00	--	--	8.4E+01	2.0E+03	**--**	**--**	**8.4E+01**	**2.0E+03**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	3.4E+03	1.6E+04	--	--	6.9E-01	3.3E+00	--	--	3.4E+02	1.6E+03	**--**	**--**	**3.4E+02**	**1.6E+03**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	9.0E+01	1.8E+02	--	--	2.4E-02	4.7E-02	--	--	9.0E+00	1.8E+01	**--**	**--**	**9.0E+00**	**1.8E+01**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	1.9E+05	2.2E+06	--	--	5.1E+01	6.0E+02	--	--	1.9E+04	2.2E+05	**--**	**--**	**1.9E+04**	**2.2E+05**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	1.9E+08	--	--	--	5.0E+04	--	--	--	1.9E+07	--	**--**	**--**	**1.9E+07**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.3E+01	5.5E-02	1.4E+00	1.4E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.5E+01	1.4E-02	1.4E-01	1.4E-01	**1.3E+01**	**1.4E-02**	**1.4E-01**	**1.4E-01**
Tributyltin	0	4.6E-01	7.2E-02	--	--	8.3E+00	2.0E+01	--	--	1.2E-01	1.8E-02	--	--	1.5E+01	4.9E+00	--	--	**8.3E+00**	**4.9E+00**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.3E+04	2.6E+04	--	--	3.5E+00	7.0E+00	--	--	1.3E+03	2.6E+03	**--**	**--**	**1.3E+03**	**2.6E+03**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	2.9E+03	7.9E+04	--	--	5.9E-01	1.6E+01	--	--	2.9E+02	7.9E+03	**--**	**--**	**2.9E+02**	**7.9E+03**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	1.2E+04	1.5E+05	--	--	2.5E+00	3.0E+01	--	--	1.2E+03	1.5E+04	**--**	**--**	**1.2E+03**	**1.5E+04**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	6.9E+03	1.2E+04	--	--	1.4E+00	2.4E+00	--	--	6.9E+02	1.2E+03	**--**	**--**	**6.9E+02**	**1.2E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	1.9E+04	--	--	--	5.0E+00	--	--	--	1.9E+03	--	**--**	**--**	**1.9E+03**	**--**
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	1.2E+02	1.2E+04	--	--	2.5E-02	2.4E+00	--	--	1.2E+01	1.2E+03	**--**	**--**	**1.2E+01**	**1.2E+03**
Zinc	0	3.6E+01	3.6E+01	7.4E+03	2.6E+04	6.5E+02	1.0E+04	2.8E+06	9.7E+06	9.1E+00	9.1E+00	7.4E+02	2.6E+03	1.2E+03	2.5E+03	2.8E+05	9.7E+05	**6.5E+02**	**2.5E+03**	**2.8E+05**	**9.7E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.1E+02
Arsenic	3.7E+02
Barium	7.5E+04
Cadmium	5.9E+00
Chromium III	9.8E+02
Chromium VI	1.2E+02
Copper	2.6E+01
Iron	1.1E+04
Lead	9.5E+01
Manganese	1.9E+03
Mercury	1.0E+01
Nickel	2.6E+02
Selenium	1.4E+02
Silver	2.3E+00
Zinc	2.6E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.150 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD 0.150

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	2.562	2.622	2.712	2.772
7Q10	41.000	N/A	41.150	N/A
30Q10	47.000	58.000	47.150	58.150
30Q5	56.000	N/A	56.150	N/A
Harm. Mean	74.000	N/A	74.150	N/A
Annual Avg.	0.000	N/A	0.150	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	14.000	12.000
30Q10 90th% Temp. Mix (deg C)	14.000	12.000
1Q10 90th% pH Mix (SU)	8.165	8.166
30Q10 90th% pH Mix (SU)	8.198	8.198
1Q10 10th% pH Mix (SU)	6.600	N/A
7Q10 10th% pH Mix (SU)	6.600	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	25.0	25.0
7Q10 Hardness (mg/L as CaCO3)	25.0	25.0

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.165
(7.204 - pH)	-0.961
(pH - 7.204)	0.961
Trout Present Criterion (mg N/l	4.093
Trout Absent Criterion (mg N/L	6.128
Trout Present?	y
Effective Criterion (mg N/L)	4.093

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	14.000
90th Percentile pH (SU)	8.198
MIN	2.850
MAX	14.000
(7.688 - pH)	-0.510
(pH - 7.688)	0.510
Early LS Present Criterion (mg N	1.799
Early LS Absent Criterion (mg N/	1.860
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.799

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.166
(7.204 - pH)	-0.962
(pH - 7.204)	0.962
Trout Present Criterion (mg N/l	4.087
Trout Absent Criterion (mg N/L	6.119
Trout Present?	y
Effective Criterion (mg N/L)	4.087

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	12.000
90th Percentile pH (SU)	8.198
MIN	2.850
MAX	12.000
(7.688 - pH)	-0.510
(pH - 7.688)	0.510
Early LS Present Criterion (mg N	1.798
Early LS Absent Criterion (mg N/	2.115
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.798

0.150 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD 0.150

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	20.000	22.000	20.150	22.150
7Q10	41.000	N/A	41.150	N/A
30Q10	47.000	58.000	47.150	58.150
30Q5	56.000	N/A	56.150	N/A
Harm. Mean	74.000	N/A	74.150	N/A
Annual Avg.	0.000	N/A	0.150	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	14.000	12.000
30Q10 90th% Temp. Mix (deg C)	14.000	12.000
1Q10 90th% pH Mix (SU)	8.195	8.196
30Q10 90th% pH Mix (SU)	8.198	8.198
1Q10 10th% pH Mix (SU)	6.600	N/A
7Q10 10th% pH Mix (SU)	6.600	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	25.000	25.000
7Q10 Hardness (mg/L as CaCO3) =	25.000	25.000

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.195
(7.204 - pH)	-0.991
(pH - 7.204)	0.991
Trout Present Criterion (mg N/l	3.861
Trout Absent Criterion (mg N/L	5.781
Trout Present?	y
Effective Criterion (mg N/L)	3.861

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	14.000
90th Percentile pH (SU)	8.198
MIN	2.850
MAX	14.000
(7.688 - pH)	-0.510
(pH - 7.688)	0.510
Early LS Present Criterion (mg N	1.799
Early LS Absent Criterion (mg N/	1.860
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.799

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.196
(7.204 - pH)	-0.992
(pH - 7.204)	0.992
Trout Present Criterion (mg N/l	3.858
Trout Absent Criterion (mg N/L	5.776
Trout Present?	y
Effective Criterion (mg N/L)	3.858

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	12.000
90th Percentile pH (SU)	8.198
MIN	2.850
MAX	12.000
(7.688 - pH)	-0.510
(pH - 7.688)	0.510
Early LS Present Criterion (mg N	1.798
Early LS Absent Criterion (mg N/	2.115
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.798

Attachment I

Outfall 002 --Wasteload Calculations

- **Mixing Zone Outputs (MIXER 2.1)**
- **Wasteload Allocation Spreadsheet**

Mixing Zone Predictions for Philpott Dam (Outfall 002) low flow

Effluent Flow = 0.767 MGD
Stream 7Q10 = 41 MGD
Stream 30Q10 = 47 MGD
Stream 1Q10 = 20 MGD
Stream slope = 0.00169 ft/ft
Stream width = 90 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .9707 ft
Length = 10746.99 ft
Velocity = .74 ft/sec
Residence Time = .1681 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.0529 ft
Length = 10031.43 ft
Velocity = .7803 ft/sec
Residence Time = .1488 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6364 ft
Length = 15352.99 ft
Velocity = .5612 ft/sec
Residence Time = 7.5988 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 13.16% of the 1Q10 is used.

Mixing Zone Predictions for Philpott Dam (Outfall 002) high flow

Effluent Flow = 0.767 MGD
Stream 7Q10 = 51 MGD
Stream 30Q10 = 58 MGD
Stream 1Q10 = 22 MGD
Stream slope = 0.00169 ft/ft
Stream width = 95 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.0693 ft
Length = 11040.28 ft
Velocity = .7888 ft/sec
Residence Time = .162 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.1547 ft
Length = 10343.7 ft
Velocity = .8293 ft/sec
Residence Time = .1444 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .651 ft
Length = 16792.33 ft
Velocity = .5699 ft/sec
Residence Time = 8.1849 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 12.22% of the 1Q10 is used.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Philpott Dam Hydroelectric Plant (Outfall 002) Permit No.: VA0090310

Receiving Stream: Smith River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	14	deg C
90% Temperature (Wet season) =	12	deg C
90% Maximum pH =	8.2	SU
10% Maximum pH =	6.6	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	y	
Trout Present Y/N? =	y	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	20	MGD
7Q10 (Annual) =	41	MGD
30Q10 (Annual) =	47	MGD
1Q10 (Wet season) =	22	MGD
30Q10 (Wet season)	58	MGD
30Q5 =	56	MGD
Harmonic Mean =	74	MGD

Mixing Information

Annual - 1Q10 Mix =	13.16	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	12.22	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	14	deg C
90% Temp (Wet season) =	11	deg C
90% Maximum pH =	8.2	SU
10% Maximum pH =	6.6	SU
Discharge Flow =	0.767	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	5.0E+04	7.3E+04	--	--	6.7E+01	9.9E+01	--	--	5.0E+03	7.3E+03	--	--	**5.0E+03**	**7.3E+03**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	4.5E+02	6.9E+02	--	--	6.1E-01	9.3E-01	--	--	4.5E+01	6.9E+01	--	--	**4.5E+01**	**6.9E+01**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	5.0E+01	2.4E+02	--	--	5.1E-02	2.5E-01	--	--	5.0E+00	2.4E+01	--	--	**5.0E+00**	**2.4E+01**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	1.3E+01	--	4.8E-02	4.9E-02	7.5E-01	--	4.9E-05	5.0E-05	2.0E+01	--	4.8E-03	4.9E-03	**1.3E+01**	--	**4.8E-03**	**4.9E-03**
Ammonia-N (mg/l) (Yearly)	0	3.83E+00	1.79E+00	--	--	1.7E+01	1.1E+02	--	--	9.56E-01	4.48E-01	--	--	2.6E+01	2.8E+01	--	--	**1.7E+01**	**2.8E+01**	--	--
Ammonia-N (mg/l) (High Flow)	0	3.83E+00	1.79E+00	--	--	1.7E+01	1.4E+02	--	--	9.56E-01	4.48E-01	--	--	2.8E+01	3.4E+01	--	--	**1.7E+01**	**3.4E+01**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	6.1E+05	3.0E+06	--	--	8.3E+02	4.0E+03	--	--	6.1E+04	3.0E+05	--	--	**6.1E+04**	**3.0E+05**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	4.1E+02	4.7E+04	--	--	5.6E-01	6.4E+01	--	--	4.1E+01	4.7E+03	--	--	**4.1E+01**	**4.7E+03**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.5E+03	8.2E+03	7.4E+02	--	8.5E+01	3.8E+01	1.0E+00	--	2.3E+03	2.0E+03	7.4E+01	--	**1.5E+03**	**2.0E+03**	**7.4E+01**	--
Barium	0	--	--	2.0E+03	--	--	--	1.5E+05	--	--	--	2.0E+02	--	--	--	1.5E+04	--	--	--	**1.5E+04**	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	2.1E+03	5.0E+04	--	--	2.2E+00	5.1E+01	--	--	2.1E+02	5.0E+03	--	--	**2.1E+02**	**5.0E+03**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	8.4E-02	1.9E-01	--	--	8.6E-05	2.0E-04	--	--	8.4E-03	1.9E-02	--	--	**8.4E-03**	**1.9E-02**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	**3.7E-01**	**1.8E+00**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	**3.7E-01**	**1.8E+00**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	**3.7E-01**	**1.8E+00**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	**3.7E-01**	**1.8E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	2.9E+01	5.2E+02	--	--	3.0E-02	5.3E-01	--	--	2.9E+00	5.2E+01	--	--	**2.9E+00**	**5.2E+01**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.0E+05	4.8E+06	--	--	1.4E+02	6.5E+03	--	--	1.0E+04	4.8E+05	--	--	**1.0E+04**	**4.8E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+03	2.1E+03	--	--	1.2E+00	2.2E+00	--	--	1.2E+02	2.1E+02	--	--	**1.2E+02**	**2.1E+02**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	4.2E+03	1.4E+05	--	--	4.3E+00	1.4E+02	--	--	4.2E+02	1.4E+04	--	--	**4.2E+02**	**1.4E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.1E+05	1.4E+05	--	--	1.5E+02	1.9E+02	--	--	1.1E+04	1.4E+04	--	--	**1.1E+04**	**1.4E+04**
Cadmium	0	8.2E-01	3.8E-01	5.0E+00	--	3.6E+00	2.1E+01	3.7E+02	--	2.1E-01	9.5E-02	5.0E-01	--	5.6E+00	5.2E+00	3.7E+01	--	**3.6E+00**	**5.2E+00**	**3.7E+01**	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	2.2E+02	1.6E+03	--	--	2.3E-01	1.6E+00	--	--	2.2E+01	1.6E+02	--	--	**2.2E+01**	**1.6E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	1.1E+01	2.3E-01	7.8E-01	7.9E-01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	1.6E+01	5.9E-02	7.8E-02	7.9E-02	**1.1E+01**	**5.9E-02**	**7.8E-02**	**7.9E-02**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.8E+06	1.3E+07	1.9E+07	--	2.2E+05	5.8E+04	2.5E+04	--	5.8E+06	3.1E+06	1.9E+06	--	**3.8E+06**	**3.1E+06**	**1.9E+06**	--
TRC	0	1.9E+01	1.1E+01	--	--	8.4E+01	6.0E+02	--	--	4.8E+00	2.8E+00	--	--	1.3E+02	1.5E+02	--	--	**8.4E+01**	**1.5E+02**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	9.6E+03	1.2E+05	--	--	1.3E+01	1.6E+02	--	--	9.6E+02	1.2E+04	--	--	**9.6E+02**	**1.2E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	3.9E+02	1.3E+04	--	--	4.0E-01	1.3E+01	--	--	3.9E+01	1.3E+03	--	--	3.9E+01	1.3E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.5E+04	8.1E+05	--	--	3.4E+01	1.1E+03	--	--	2.5E+03	8.1E+04	--	--	2.5E+03	8.1E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	7.4E+04	1.2E+05	--	--	1.0E+02	1.6E+02	--	--	7.4E+03	1.2E+04	--	--	7.4E+03	1.2E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	6.0E+03	1.1E+04	--	--	8.1E+00	1.5E+01	--	--	6.0E+02	1.1E+03	--	--	6.0E+02	1.1E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	3.7E-01	2.2E+00	--	--	2.1E-02	1.0E-02	--	--	5.6E-01	5.6E-01	--	--	3.7E-01	5.6E-01	--	--
Chromium III	0	1.8E+02	2.4E+01	--	--	8.1E+02	1.3E+03	--	--	4.6E+01	6.0E+00	--	--	1.2E+03	3.2E+02	--	--	8.1E+02	3.2E+02	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	7.1E+01	6.0E+02	--	--	4.0E+00	2.8E+00	--	--	1.1E+02	1.5E+02	--	--	7.1E+01	1.5E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	7.4E+03	--	--	--	1.0E+01	--	--	--	7.4E+02	--	--	--	7.4E+02	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	3.8E-04	1.8E-03	--	--	3.7E-02	1.8E-01	--	--	3.7E-02	1.8E-01
Copper	0	3.6E+00	2.7E+00	1.3E+03	--	1.6E+01	1.5E+02	9.6E+04	--	9.1E-01	6.8E-01	1.3E+02	--	2.5E+01	3.7E+01	9.6E+03	--	1.6E+01	3.7E+01	9.6E+03	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	9.7E+01	2.8E+02	1.0E+04	1.2E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	1.5E+02	7.1E+01	1.0E+03	1.2E+05	9.7E+01	7.1E+01	1.0E+03	1.2E+05
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	3.0E-01	3.0E-01	--	--	3.1E-04	3.1E-04	--	--	3.0E-02	3.0E-02	--	--	3.0E-02	3.0E-02
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	2.1E-01	2.1E-01	--	--	2.2E-04	2.2E-04	--	--	2.1E-02	2.1E-02	--	--	2.1E-02	2.1E-02
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	4.9E+00	5.4E-02	2.1E-01	2.1E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	7.4E+00	1.4E-02	2.1E-02	2.1E-02	4.9E+00	1.4E-02	2.1E-02	2.1E-02
Demeton	0	--	1.0E-01	--	--	--	5.4E+00	--	--	--	2.5E-02	--	--	--	1.4E+00	--	--	--	1.4E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	7.5E-01	9.3E+00	--	--	4.3E-02	4.3E-02	--	--	1.2E+00	2.3E+00	--	--	7.5E-01	2.3E+00	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	3.7E-01	1.8E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.1E+04	9.6E+04	--	--	4.2E+01	1.3E+02	--	--	3.1E+03	9.6E+03	--	--	3.1E+03	9.6E+03
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.4E+04	7.1E+04	--	--	3.2E+01	9.6E+01	--	--	2.4E+03	7.1E+03	--	--	2.4E+03	7.1E+03
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	4.7E+03	1.4E+04	--	--	6.3E+00	1.9E+01	--	--	4.7E+02	1.4E+03	--	--	4.7E+02	1.4E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	2.0E+01	2.7E+01	--	--	2.1E-02	2.8E-02	--	--	2.0E+00	2.7E+00	--	--	2.0E+00	2.7E+00
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	5.4E+02	1.7E+04	--	--	5.5E-01	1.7E+01	--	--	5.4E+01	1.7E+03	--	--	5.4E+01	1.7E+03
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	3.7E+02	3.6E+04	--	--	3.8E-01	3.7E+01	--	--	3.7E+01	3.6E+03	--	--	3.7E+01	3.6E+03
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.4E+04	5.3E+05	--	--	3.3E+01	7.1E+02	--	--	2.4E+03	5.3E+04	--	--	2.4E+03	5.3E+04
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.0E+04	7.4E+05	--	--	1.4E+01	1.0E+03	--	--	1.0E+03	7.4E+04	--	--	1.0E+03	7.4E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	5.7E+03	2.1E+04	--	--	7.7E+00	2.9E+01	--	--	5.7E+02	2.1E+03	--	--	5.7E+02	2.1E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	7.4E+03	--	--	--	1.0E+01	--	--	--	7.4E+02	--	--	--	7.4E+02	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	4.9E+02	1.5E+04	--	--	5.0E-01	1.5E+01	--	--	4.9E+01	1.5E+03	--	--	4.9E+01	1.5E+03
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	3.3E+02	2.0E+04	--	--	3.4E-01	2.1E+01	--	--	3.3E+01	2.0E+03	--	--	3.3E+01	2.0E+03
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	1.1E+00	3.0E+00	5.1E-02	5.3E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	1.6E+00	7.6E-01	5.1E-03	5.3E-03	1.1E+00	7.6E-01	5.1E-03	5.3E-03
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.3E+06	3.3E+06	--	--	1.7E+03	4.4E+03	--	--	1.3E+05	3.3E+05	--	--	1.3E+05	3.3E+05
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	2.8E+04	6.3E+04	--	--	3.8E+01	8.5E+01	--	--	2.8E+03	6.3E+03	--	--	2.8E+03	6.3E+03
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.0E+07	8.1E+07	--	--	2.7E+04	1.1E+05	--	--	2.0E+06	8.1E+06	--	--	2.0E+06	8.1E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.5E+05	3.3E+05	--	--	2.0E+02	4.5E+02	--	--	1.5E+04	3.3E+04	--	--	1.5E+04	3.3E+04
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	5.1E+03	3.9E+05	--	--	6.9E+00	5.3E+02	--	--	5.1E+02	3.9E+04	--	--	5.1E+02	3.9E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	9.6E+02	2.1E+04	--	--	1.3E+00	2.8E+01	--	--	9.6E+01	2.1E+03	--	--	9.6E+01	2.1E+03
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+02	3.3E+03	--	--	1.1E-01	3.4E+00	--	--	1.1E+01	3.3E+02	--	--	1.1E+01	3.3E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	3.7E-06	3.8E-06	--	--	5.0E-09	5.1E-09	--	--	3.7E-07	3.8E-07	--	--	3.7E-07	3.8E-07
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	3.5E+01	1.9E+02	--	--	3.6E-02	2.0E-01	--	--	3.5E+00	1.9E+01	--	--	3.5E+00	1.9E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	9.7E-01	3.0E+00	4.6E+03	6.6E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.5E+00	7.6E-01	4.6E+02	6.6E+02	9.7E-01	7.6E-01	4.6E+02	6.6E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	9.7E-01	3.0E+00	4.6E+03	6.6E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.5E+00	7.6E-01	4.6E+02	6.6E+02	9.7E-01	7.6E-01	4.6E+02	6.6E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	9.7E-01	3.0E+00	--	--	5.5E-02	1.4E-02	--	--	1.5E+00	7.6E-01	--	--	9.7E-01	7.6E-01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	4.6E+03	6.6E+03	--	--	6.2E+00	8.9E+00	--	--	4.6E+02	6.6E+02	--	--	4.6E+02	6.6E+02
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	3.8E-01	2.0E+00	4.4E+00	4.4E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	5.8E-01	4.9E-01	4.4E-01	4.4E-01	3.8E-01	4.9E-01	4.4E-01	4.4E-01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.1E+01	2.2E+01	--	--	2.9E-02	3.0E-02	--	--	2.1E+00	2.2E+00	--	--	2.1E+00	2.2E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	3.9E+04	1.6E+05	--	--	5.3E+01	2.1E+02	--	--	3.9E+03	1.6E+04	--	--	**3.9E+03**	**1.6E+04**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	9.6E+03	1.0E+04	--	--	1.3E+01	1.4E+01	--	--	9.6E+02	1.0E+03	--	--	**9.6E+02**	**1.0E+03**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	8.1E+04	3.9E+05	--	--	1.1E+02	5.3E+02	--	--	8.1E+03	3.9E+04	--	--	**8.1E+03**	**3.9E+04**
Foaming Agents	0	--	--	5.0E+02	--	--	--	3.7E+04	--	--	--	5.0E+01	--	--	--	3.7E+03	--	--	--	**3.7E+03**	--
Guthion	0	--	1.0E-02	--	--	--	5.4E-01	--	--	--	2.5E-03	--	--	--	1.4E-01	--	--	--	**1.4E-01**	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	2.3E+00	2.1E-01	7.7E-02	7.7E-02	1.3E-01	9.5E-04	7.9E-05	7.9E-05	3.5E+00	5.2E-02	7.7E-03	7.7E-03	**2.3E+00**	**5.2E-02**	**7.7E-03**	**7.7E-03**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	2.3E+00	2.1E-01	3.8E-02	3.8E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	3.5E+00	5.2E-02	3.8E-03	3.8E-03	**2.3E+00**	**5.2E-02**	**3.8E-03**	**3.8E-03**
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	2.7E-01	2.8E-01	--	--	2.8E-04	2.9E-04	--	--	2.7E-02	2.8E-02	--	--	**2.7E-02**	**2.8E-02**
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	4.3E+02	1.8E+04	--	--	4.4E-01	1.8E+01	--	--	4.3E+01	1.8E+03	--	--	**4.3E+01**	**1.8E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	2.5E+00	4.8E+00	--	--	2.6E-03	4.9E-03	--	--	2.5E-01	4.8E-01	--	--	**2.5E-01**	**4.8E-01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	8.9E+00	1.7E+01	--	--	9.1E-03	1.7E-02	--	--	8.9E-01	1.7E+00	--	--	**8.9E-01**	**1.7E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	4.2E+00	--	9.6E+01	1.8E+02	2.4E-01	--	9.8E-02	1.8E-01	6.4E+00	--	9.6E+00	1.8E+01	**4.2E+00**	--	**9.6E+00**	**1.8E+01**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.0E+03	8.1E+04	--	--	4.0E+00	1.1E+02	--	--	3.0E+02	8.1E+03	--	--	**3.0E+02**	**8.1E+03**
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.4E+03	3.2E+03	--	--	1.4E+00	3.3E+00	--	--	1.4E+02	3.2E+02	--	--	**1.4E+02**	**3.2E+02**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	1.1E+02	--	--	--	5.0E-01	--	--	--	2.7E+01	--	--	--	**2.7E+01**	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	3.7E+00	1.8E+01	--	--	3.8E-03	1.8E-02	--	--	3.7E-01	1.8E+00	--	--	**3.7E-01**	**1.8E+00**
Iron	0	--	--	3.0E+02	--	--	--	2.2E+04	--	--	--	3.0E+01	--	--	--	2.2E+03	--	--	--	**2.2E+03**	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	3.4E+04	9.4E+05	--	--	3.5E+01	9.6E+02	--	--	3.4E+03	9.4E+04	--	--	**3.4E+03**	**9.4E+04**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Lead	0	2.0E+01	2.3E+00	1.5E+01	--	9.0E+01	1.3E+02	1.1E+03	--	5.1E+00	5.8E-01	1.5E+00	--	1.4E+02	3.1E+01	1.1E+02	--	**9.0E+01**	**3.1E+01**	**1.1E+02**	--
Malathion	0	--	1.0E-01	--	--	--	5.4E+00	--	--	--	2.5E-02	--	--	--	1.4E+00	--	--	--	**1.4E+00**	--	--
Manganese	0	--	--	5.0E+01	--	--	--	3.7E+03	--	--	--	5.0E+00	--	--	--	3.7E+02	--	--	--	**3.7E+02**	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	6.2E+00	4.2E+01	- -	- -	3.5E-01	1.9E-01	- -	--	9.5E+00	1.0E+01	- -	--	**6.2E+00**	**1.0E+01**	- -	- -
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.5E+03	1.1E+05	--	--	4.7E+00	1.5E+02	--	--	3.5E+02	1.1E+04	--	--	**3.5E+02**	**1.1E+04**
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	4.5E+03	5.8E+05	--	--	4.6E+00	5.9E+02	--	--	4.5E+02	5.8E+04	--	--	**4.5E+02**	**5.8E+04**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.6E+00	7.4E+03	--	--	7.5E-03	1.0E+01	--	--	4.1E-01	7.4E+02	--	--	**4.1E-01**	**7.4E+02**	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Nickel	0	5.6E+01	6.3E+00	6.1E+02	4.6E+03	2.5E+02	3.4E+02	4.5E+04	3.4E+05	1.4E+01	1.6E+00	6.1E+01	4.6E+02	3.8E+02	8.5E+01	4.5E+03	3.4E+04	**2.5E+02**	**8.5E+01**	**4.5E+03**	**3.4E+04**
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	7.4E+05	--	--	--	1.0E+03	--	--	--	7.4E+04	--	--	--	**7.4E+04**	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.3E+03	5.1E+04	--	--	1.7E+00	6.9E+01	--	--	1.3E+02	5.1E+03	--	--	**1.3E+02**	**5.1E+03**
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	6.7E-01	2.9E+03	--	--	6.9E-04	3.0E+00	--	--	6.7E-02	2.9E+02	--	--	**6.7E-02**	**2.9E+02**
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	3.2E+03	5.8E+03	--	--	3.3E+00	6.0E+00	--	--	3.2E+02	5.8E+02	--	--	**3.2E+02**	**5.8E+02**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	4.9E+00	5.0E+02	--	--	5.0E-03	5.1E-01	--	--	4.9E-01	5.0E+01	--	--	**4.9E-01**	**5.0E+01**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.2E+02	3.6E+02	--	--	7.0E+00	1.7E+00	--	--	1.9E+02	9.0E+01	--	--	**1.2E+02**	**9.0E+01**	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	2.9E-01	7.1E-01	--	--	1.6E-02	3.3E-03	--	--	4.4E-01	1.8E-01	--	--	**2.9E-01**	**1.8E-01**	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	7.6E-01	6.2E-02	6.2E-02	--	3.5E-03	6.4E-05	6.4E-05	--	1.9E-01	6.2E-03	6.2E-03	--	**1.9E-01**	**6.2E-03**	**6.2E-03**
Pentachlorophenol [C]	0	5.8E+00	4.5E+00	2.7E+00	3.0E+01	2.6E+01	2.4E+02	2.6E+02	2.9E+03	1.5E+00	1.1E+00	2.7E-01	3.0E+00	4.0E+01	6.1E+01	2.6E+01	2.9E+02	**2.6E+01**	**6.1E+01**	**2.6E+01**	**2.9E+02**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	7.4E+05	6.4E+07	--	--	1.0E+03	8.6E+04	--	--	7.4E+04	6.4E+06	--	--	**7.4E+04**	**6.4E+06**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	6.1E+04	3.0E+05	--	--	8.3E+01	4.0E+02	--	--	6.1E+03	3.0E+04	--	--	**6.1E+03**	**3.0E+04**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.1E+03	--	--	--	1.5E+00	--	--	--	1.1E+02	--	--	--	**1.1E+02**	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	3.0E+02	3.0E+02	--	--	4.0E-01	4.0E-01	--	--	3.0E+01	3.0E+01	--	--	**3.0E+01**	**3.0E+01**
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	3.7E+02	--	--	--	5.0E-01	--	--	--	3.7E+01	--	--	--	**3.7E+01**	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.2E+03	--	--	--	3.0E+00	--	--	--	2.2E+02	--	--	--	**2.2E+02**	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	8.9E+01	2.7E+02	1.3E+04	3.1E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	1.4E+02	6.8E+01	1.3E+03	3.1E+04	**8.9E+01**	**6.8E+01**	**1.3E+03**	**3.1E+04**
Silver	0	3.2E-01	--	--	--	1.4E+00	--	--	--	7.9E-02	--	--	--	2.2E+00	--	--	--	**1.4E+00**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	1.9E+07	--	--	--	2.5E+04	--	--	--	1.9E+06	--	--	--	**1.9E+06**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+02	3.9E+03	--	--	1.7E-01	4.0E+00	--	--	1.7E+01	3.9E+02	--	--	**1.7E+01**	**3.9E+02**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	6.7E+02	3.2E+03	--	--	6.9E-01	3.3E+00	--	--	6.7E+01	3.2E+02	--	--	**6.7E+01**	**3.2E+02**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.8E+01	3.5E+01	--	--	2.4E-02	4.7E-02	--	--	1.8E+00	3.5E+00	--	--	**1.8E+00**	**3.5E+00**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	3.8E+04	4.4E+05	--	--	5.1E+01	6.0E+02	--	--	3.8E+03	4.4E+04	--	--	**3.8E+03**	**4.4E+04**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	3.7E+07	--	--	--	5.0E+04	--	--	--	3.7E+06	--	--	--	**3.7E+06**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	3.2E+00	1.1E-02	2.7E-01	2.7E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	4.9E+00	2.7E-03	2.7E-02	2.7E-02	**3.2E+00**	**2.7E-03**	**2.7E-02**	**2.7E-02**
Tributyltin	0	4.6E-01	7.2E-02	--	--	2.0E+00	3.9E+00	--	--	1.2E-01	1.8E-02	--	--	3.1E+00	9.8E-01	--	--	**2.0E+00**	**9.8E-01**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	2.6E+03	5.2E+03	--	--	3.5E+00	7.0E+00	--	--	2.6E+02	5.2E+02	--	--	**2.6E+02**	**5.2E+02**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	5.8E+02	1.6E+04	--	--	5.9E-01	1.6E+01	--	--	5.8E+01	1.6E+03	--	--	**5.8E+01**	**1.6E+03**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	2.4E+03	2.9E+04	--	--	2.5E+00	3.0E+01	--	--	2.4E+02	2.9E+03	--	--	**2.4E+02**	**2.9E+03**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+03	2.3E+03	--	--	1.4E+00	2.4E+00	--	--	1.4E+02	2.3E+02	--	--	**1.4E+02**	**2.3E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	3.7E+03	--	--	--	5.0E+00	--	--	--	3.7E+02	--	--	--	**3.7E+02**	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	2.4E+01	2.3E+03	--	--	2.5E-02	2.4E+00	--	--	2.4E+00	2.3E+02	--	--	**2.4E+00**	**2.3E+02**
Zinc	0	3.6E+01	3.6E+01	7.4E+03	2.6E+04	1.6E+02	2.0E+03	5.5E+05	1.9E+06	9.1E+00	9.1E+00	7.4E+02	2.6E+03	2.5E+02	5.0E+02	5.5E+04	1.9E+05	**1.6E+02**	**5.0E+02**	**5.5E+04**	**1.9E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	4.1E+01
Arsenic	7.4E+01
Barium	1.5E+04
Cadmium	1.5E+00
Chromium III	1.9E+02
Chromium VI	2.8E+01
Copper	6.5E+00
Iron	2.2E+03
Lead	1.9E+01
Manganese	3.7E+02
Mercury	2.5E+00
Nickel	5.1E+01
Selenium	3.5E+01
Silver	5.6E-01
Zinc	6.4E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.767 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD 0.767

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	2.632	2.688	3.399	3.455
7Q10	41.000	N/A	41.767	N/A
30Q10	47.000	58.000	47.767	58.767
30Q5	56.000	N/A	56.767	N/A
Harm. Mean	74.000	N/A	74.767	N/A
Annual Avg.	0.000	N/A	0.767	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	14.000	11.778
30Q10 90th% Temp. Mix (deg C)	14.000	11.987
1Q10 90th% pH Mix (SU)	8.200	8.200
30Q10 90th% pH Mix (SU)	8.200	8.200
1Q10 10th% pH Mix (SU)	6.600	N/A
7Q10 10th% pH Mix (SU)	6.600	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	25.0	25.0
7Q10 Hardness (mg/L as CaCO3)	25.0	25.0

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.200
(7.204 - pH)	-0.996
(pH - 7.204)	0.996
Trout Present Criterion (mg N/l	3.825
Trout Absent Criterion (mg N/L	5.727
Trout Present?	y
Effective Criterion (mg N/L)	3.825

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	14.000
90th Percentile pH (SU)	8.200
MIN	2.850
MAX	14.000
(7.688 - pH)	-0.512
(pH - 7.688)	0.512
Early LS Present Criterion (mg N	1.793
Early LS Absent Criterion (mg N/	1.854
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.793

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.200
(7.204 - pH)	-0.996
(pH - 7.204)	0.996
Trout Present Criterion (mg N/l	3.825
Trout Absent Criterion (mg N/L	5.727
Trout Present?	y
Effective Criterion (mg N/L)	3.825

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	11.987
90th Percentile pH (SU)	8.200
MIN	2.850
MAX	11.987
(7.688 - pH)	-0.512
(pH - 7.688)	0.512
Early LS Present Criterion (mg N	1.793
Early LS Absent Criterion (mg N/	2.111
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.793

0.767 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD 0.767

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	20.000	22.000	20.767	22.767
7Q10	41.000	N/A	41.767	N/A
30Q10	47.000	58.000	47.767	58.767
30Q5	56.000	N/A	56.767	N/A
Harm. Mean	74.000	N/A	74.767	N/A
Annual Avg.	0.000	N/A	0.767	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	14.000	11.966
30Q10 90th% Temp. Mix (deg C)	14.000	11.987
1Q10 90th% pH Mix (SU)	8.200	8.200
30Q10 90th% pH Mix (SU)	8.200	8.200
1Q10 10th% pH Mix (SU)	6.600	N/A
7Q10 10th% pH Mix (SU)	6.600	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	25.000	25.000
7Q10 Hardness (mg/L as CaCO3) =	25.000	25.000

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.200
(7.204 - pH)	-0.996
(pH - 7.204)	0.996
Trout Present Criterion (mg N/l	3.825
Trout Absent Criterion (mg N/L	5.727
Trout Present?	y
Effective Criterion (mg N/L)	3.825

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	14.000
90th Percentile pH (SU)	8.200
MIN	2.850
MAX	14.000
(7.688 - pH)	-0.512
(pH - 7.688)	0.512
Early LS Present Criterion (mg N	1.793
Early LS Absent Criterion (mg N/	1.854
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.793

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.200
(7.204 - pH)	-0.996
(pH - 7.204)	0.996
Trout Present Criterion (mg N/l	3.825
Trout Absent Criterion (mg N/L	5.727
Trout Present?	y
Effective Criterion (mg N/L)	3.825

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	11.987
90th Percentile pH (SU)	8.200
MIN	2.850
MAX	11.987
(7.688 - pH)	-0.512
(pH - 7.688)	0.512
Early LS Present Criterion (mg N	1.793
Early LS Absent Criterion (mg N/	2.111
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.793

Attachment J

NPDES Permit Rating Worksheet

NPDES PERMIT RATING WORK SHEET

NPDES NO. VA00900310

☐ Regular Addition
☐ DiscretionaryAddition
☐ Score change, but no status change
☐ Deletion

Facility Name: Philpott Dam Hydroelectric Plant

City: Bassett, Virginia

Receiving Water: Smith River

Reach Number: _____

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate
☐ YES; score is 600 (stop here) ■ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
■ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 4911 Other SIC Codes: _____
Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	15	☐ 7.	7	35
☐ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐ 2.	2	10	☐ 5.	5	25	☐ 9.	9	45
			■ 6.	6	30	☐ 10.	10	50

Code Number Checked: 6

Total Points Factor 1: 30

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A ☐ Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☐	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	☐	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	☐	24	50
Type III: Flow < 1 MGD	☐	31	0
Flow 1 to 5 MGD	☐	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

Section B ☐ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	■	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: 41
Total Points Factor 2: 0

FACTOR 3: Conventional Pollutants NPDES NO: VA0090310

(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ☐ BOD ☐ COD ☐ Other:_____

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: _NA__

Points Scored: __0___

B. Total Suspended Solids (TSS)

			Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 5000 lbs/day	3	15
	☐	> 5000 lbs/day	4	20

Code Checked: __1__

Points Scored: __0__

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: _____

		Nitrogen Equivalent	*Code*	*Points*
Permit Limits: (check one)	☐	< 300 lbs/day	1	0
	☐	300 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: __NA_

Points Scored: __0__

Total Points Factor 3: __0__

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

■ YES (If yes, check toxicity potential number below)

☐ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			■ 6.	6	10	☐ 10.	10	30

Code Number Checked: _6_

Total Points Factor 4: _10

FACTOR 5: Water Quality Factors NPDES NO. VA0090310

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:

		Code	Points
■	Yes	1	10
☐	No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

		Code	Points
■	Yes	1	0
☐	No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

		Code	Points
☐	Yes	1	10
■	No	2	0

Code Number Checked: A 1 B 1 C 2

Points Factor 5: A 10 + B 0 + C 0 = 10 TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from Factor 2): 41 *Enter the multiplication factor that corresponds to the flow code:* 0.10

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
☐	3	3	30
■	4	4	0
☐	5	5	20

HPRI code checked: ___

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score: (HPRI Score) 0 X (Multiplication Factor) 0.1 = 0 (TOTAL POINTS)

B. Additional Points ☐ NEP Program
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
☐ Yes	1	10
■ No	2	0

C. Additional Points ☐ Great Lakes Area of Concern
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

	Code	Points
☐ Yes	1	10
■ No	2	0

Code Number Checked: A 4 B 2 C 2

Points Factor 6: A 0 + B 0 + C 0 = 0 TOTAL

SCORE SUMMARY

NPDES NO. VA0090310

Factor	Description	Total Points
1	Toxic Pollutant Potential	30
2	Flows/Streamflow Volume	0
3	Conventional Pollutants	0
4	Public Health Impacts	10
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	50

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) ■ No

S2. If the answer to the above questions is no, would you like this facility to be a discretionary major? NA

☐ No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

NEW SCORE: 50

OLD SCORE: 50

Becky L. France
Permit Reviewer's Name

(540) 562-6700
Phone Number

4/7/2014
Date

Attachment K

Public Notice

PUBLIC NOTICE – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Henry County.
PUBLIC COMMENT PERIOD: July 24, 2014 through August 22, 2014
PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board
APPLICANT NAME, ADDRESS, AND PERMIT NUMBER: U.S. Corps of Engineers, Philpott Dam Hydroelectric Plant, 1058 Philpott Dam Road, Bassett, VA 24055, VA0090310
FACILITY NAME AND LOCATION: Philpott Dam Hydroelectric Plant, 810 Dam Spillway Road, Bassett, VA
PROJECT DESCRIPTION: The U.S. Corps of Engineers has applied for a reissuance of a permit for the hydroelectric plant in Henry County. The applicant proposes to release cooling water, shaft leakage, dam seepage, and ground water from the hydroelectric plant at a 30 day maximum average rate of 15,000 gallons per day from outfall 001 and 76,700 gallons per day from outfall 002 into a water body. The facility proposes to release the cooling water into the Smith River in the Smith River/Town Creek/Blackberry Creek Watershed (VAW-L52R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: oil and grease, pH, and temperature.
HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for a public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if a public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.
CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION: Becky L. France; ADDRESS: Virginia Department of Environmental Quality, Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; (540) 562-6700; E-MAIL ADDRESS: becky.france@deq.virginia.gov; FAX: (540) 562-6725. The public may review the draft permit and application at the DEQ office named above by appointment or may request copies of the documents from the contact person listed above.